The Joint Effects of Personality and Behavioural Intentions on Academic Knowledge Productivity Behaviours

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(000618308)

A Thesis presented for the degree of
Doctor of Philosophy

Durham University Business School (Management)
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ABSTRACTS

This current study investigates individual differences factors impacting the Knowledge Productivity Behaviour of academic. In this study academic knowledge productivity are defined as the capability with which individuals achieve creation and production of knowledge knowledge-based improvements, exploitation, and innovations through their knowledge activities.

In this study the Big Five (B5) personality traits of openness, conscientiousness, extraversion, agreeableness and neuroticism are proposed to influence productivity. In addition, these personality traits are expected, at least in part, to have their effect mediated and moderate through variables associated with the Theory of Planned Behaviour (TPB).

The methodology used in this study was quantitative in nature. A survey methodology was used with a Malaysian working academic sample. This study describes results to date from a pilot study, and the very beginning of analysis from main study, main study data (Time 1) and follow up data approximately a year after (Time 2) and a supplementary qualitative data. This study adopts a quantitative method and online questionnaires were used as the instruments for data collection. The on-line survey was administered by emailing potential respondents a link. Volunteer respondents were academics from Malaysia Public University (N=985).

The descriptive analysis of the pilot, main data and one-year follow-up data was done using SPSS version 20. In particular, in main study and one-year follow-up data, estimating the path coefficients associated with specific hypotheses, indirect effects were estimated for the hypotheses which propose that TPB mediates personality effects on KPB, in order to determine whether the mediated effects are statistically significant. These were determined using path analysis conducted with an accepted SEM package such as MPlus.

Overall in this study, all possible relationships among the set of five personalities (Big Five), the Theory of Planned Behaviour and Knowledge Productivity Behaviour (KPB), as well as KPB construct; Knowledge Acqusition (KA), Knowledge Sharing (KS) and Knowledge Transfer (KT) were estimated. These results support the preliminary hypotheses, however for the main study (Time 1 social science data) only openness, agreeableness and extraversion

were reported significant with KPB. Meanwhile only Openness were reported significant with KPB in Time 2 social science data.

As was reported in this study, all four of the TPB variables, i.e., Attitude, Norm Perceived Behavioural Control and Intention, have strong, positive, and statistically significant relationships with each other. However, Subjective Norms did not predict behavioural intentions for KPB. Moreover sub-models specified to test the Big Five relationship with TPB for their direct effects, predicting Emotional Stability and Openness traits on Attitude, both Time 1 and Time 2 models reported that only Openness variable had significant effects on Attitude.

Furthermore, this study also estimated the interaction effects of Extraversion, Agreeableness and Conscientiousness with Subjective Norms and Perceived Behavioural Control on Intention. Nonetheless, these results indicate all of these hypotheses are not supported both in Time 1 and Time 2 models. Finally, a set of multi-group analyses performed to compare estimates from the two Time 1 samples (Social Science and Science Technology). The results show Openness to Social Norms path was significantly different in the two samples.

In sum, based on the discussion of the outcomes, it is expected that this study will bring better understanding to the current knowledge and theoretically and empirically contribute to a bigger literature on Big Five personality traits and the Theory of Planned Behaviour. In addition, through this study, academics in Malaysia public university can take the opportunities to be more productive in Knowledge Productivity Behaviour. Apart from that, other theories such as understanding the concept of motivation can be added to this research. user satisfaction or university-industry-government relationships and measuring the effective of organisation as well for results of the academics KPB can be expanded to a further research and increased more details.

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Finally, I hope that this thesis can fulfill the requirements of its standard and can be a good guide for the reader. Thank you.

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CHAPTER 1: INTRODUCTION

1.0 Introduction

The general topic of this thesis is the investigation of factors that influence individual university faculty members to engage in behaviours related to knowledge production and dissemination. More specifically, this study investigated personality and attitudinal components. Knowledge Productivity Behaviour (KPB) can be affected by the attitudinal component as it focuses specifically on the role of behavioural intentions in the process of academic research. Furthermore, it utilizes a large sample of academics from a Malaysia Public University.

A quantitative, survey-based methodology is adopted to collect data and test *a priori* theoretical models proposing that the Big Five personality variables and the attitudinal components identified in the Theory of Planned Behaviour (TPB) are relevant antecedents of knowledge production behaviours. In general, this chapter comprise the background of the study, statement of the problem, purpose of the study, research gap, its objectives and research questions, the significance/ anticipated contribution of the study, its limitations and the overall structure of the thesis.

In order to increase the quality and quantity of research and to achieve the research-active academics, national research assessments, international league tables, and the changing of pattern of government research funding were implemented. This had been supported by an increasing number of studies that examines various features of the nature of research which the trends are distinguishable. Initially, factors that contribute to productivity of the research have been highlighted with the academics' disciplines. Consequently, it has been utilized across the countries with greater emphasis on the way it is being developed (e.g. Serenko and Bontis 2004; Grapin et al. 2013).

For example, in the United Kingdom (UK), in tertiary education sector, the research is funded mainly by the Government with extra support from additional contributions such as from international sources and private sector. For public funding, the funds are from various Government Departments with research budgets. However, the major portion of fund comes from the Department for Business, Innovation and Science (BIS) that particularly funds a research from science and higher education budget (Research Innovation Network, 2010).

In Malaysia (the context of the current study), the Malaysian government also has invested heavily in its education sector, with a deep commitment to improving the standards and quality of higher education. According to the Malaysia budget 2016, the Government allocated RM13.378 billions of its expenditure towards education sectors at all levels. The Malaysia budget 2017, yet again shows tremendous support, including that the government has highlighted a sum of RM100m research fund for higher education institutions.

Quality of research plays a vital role in attaining the excellence in academic activities. Various research quality approaches can be demonstrated such as mentioning the intellectual property, publication and citations, research funding, and post-graduate supervision. Globally, publication is one of the approaches (Moore & Griffin, 2006). that had been commonly recognized around the world as it allows the expansion of social and knowledge economy.

For example, in Australian universities, publication outputs are recognised as indicators of both individual and organisational performance (McGrail et al., 2006). Additionally, publication outputs are essential criteria for researchers in gaining competitive research funding and for universities to attain institutional grants from the Commonwealth Department of Education Science and Training (DEST, 2004).

In many working environment such as academic's management, knowledge management is crucial. However, it is a challenge to measure the outcome of individual's knowledge management and to differentiate the aspects of academic knowledge productivity.

In response to this gap, this study develops a knowledge productivity measure for assessing individual knowledge productivity behaviour as evidenced in reports of the activities of knowledge acquisition, knowledge sharing and knowledge transfer. This study explores knowledge productivity of academics (in Malaysia context) but also investigates the empirical data from academics with quantitative data analyses of both survey data from time 1 and time 2.

1.1 Background of the study

Universities and similar academic institutions play a big role in the development and improvement of nations through the research and discovery activities of their scholars (Uzoka, 2008). In order to build accentuation on the quality and amount of research and development, national research institutions, including international associations and changing

patterns of government research funding allocation have driven the development and productivity of research. Academics are expected to produce more and more research which is dynamic and diverse in nature (e.g. Serenko & Bontis 2004; Grapin, Kranzler & Daley 2013).

National governments and other varied interests have allocated large sums of money to advance research and development in university settings. Whether these investments have been successful in increasing research productivity and performance can in part be assessed by looking at universities' world rankings (Williams & Van Dyke, 2008). Staff in Higher Education Institutions (HEIs) are thought to be views as important research asset to their institutions. Academics specifically account for an important factor in budget allocation for research and development and have played an imperative part in accomplishing the objectives of the institutions and nations (Rowley, 1996).

To address the national and university objectives, the Malaysian government through the Ministry of Higher Education (MOHE) and Public universities are trying a number of different approaches to improve their research and development productivity. In ensuring higher education to be at par with global standards, previously, the Government devoted RM13.378 billion of its expenditure to education at all levels (Malaysia Budget 2016). In the year 2017, an enormous allocation of RM7.4 billion was allocated for 20 public universities. In addition, a sum of RM100 million was allocated to higher education institutions to foster their research cultures, as well as to increase publications and intellectual property (Malaysia Annual Budget, 2017). Inclusion in the national annual budget means that in the 21st century, government has periodically invested a large amount of money to the universities with the aim of increasing the research development.

Aiming at achieving recognition of both the nation itself and universities, publication of scholarly articles has been deemed vital. Publication in the form of research has been recognized worldwide as a medium of contribution towards university rankings and boosting the knowledge economy of the nations. Research quality is of supreme value in the attainment of excellence in academic activities, which can be demonstrated through intellectual property, publications and citations, research funding and post-graduate supervision (Dhillon, Ibrahim & Selamat, 2015).

Even though key duties and responsibilities can vary across various institutions, it is not a secret that research is an important component of academic careers. Academics at most

universities are expected to undertake research. Typically, their employers encourage and expect them to publish high quality papers on their work, and to attend academic conferences to share their findings. Indeed, research publications generally improve an academic's credentials, and publishing and presenting research results is seen as an important process of knowledge creation and knowledge dissemination. By doing so, academicians also help raise the academic profile and rankings of their educational institutions. Academics' engagement in these sorts of activities will be the key outcome studied in the current study.

Yet most academics must balance multiple role demands comprised of teaching, research, and administrative responsibilities. As a result, academics in higher education often struggle to balance teaching and administration with undertaking research (Izah & Nor, 2009). Determining how to strengthen knowledge-based productivity by increasing and improving knowledge activities, such as the research output of educational institutions (Flagg, Gilley, & Park, 2011; Levitan & Ray, 1992; Long et al., 1998) has become an important objective in the contemporary study of human performance (Kapyla, Jaaskelainen & Lonnqvist, 2010). Although there are many studies of academic research performance, associated influences, and their perceptions about research (Bai & Hudson, 2010), few studies have been conducted of academician's own knowledge productivity behaviour.

The main purpose of this study then is to probe individual difference factors that influence knowledge production behaviours in two samples of academics who are employed in a large, multi-campus public university located in Malaysia. This study aims to provide a better insight on the behavioural intentions or motivation of dedicated underlying staff at several professional levels and to identify the key individual-level factors that affect the productivity of the research by academic staff. It is recommended to the policy makers in the university to develop a long-term effective research management practices and strategy.

1.2 Statement of the Problem

Academic knowledge productivity is likely to be influenced by a wide variety of factors, ranging from the individual to the organisational level. Based on theory, prior studies have looked at how human capital, organization capital, and social capital factors might influence research productivity (Wood, 1990; Carole, Bruce, Deborah, Kelly & Justin, 2005). However, to date, very little attention has been paid specifically to the role that might be played by the researcher's personality and his or her attitude towards engaging in behaviours that enhance knowledge productivity. The current study addresses this gap by suggesting that

personality influences academic knowledge productivity both directly, and also indirectly by affecting behavioural intentions and their antecedents (i.e., attitudes, acceptance of social norms and perceived behaviour control over factors related to doing research activities). From a practical perspective, this research also addresses the issue that universities and their administrations are looking for guidance on how to motivate and promote productivity amongst faculty members in order to maintain and achieve accreditation, and thus indirectly, to increase the creation and dissemination of knowledge.

1.3 Purpose of the Study

In many working environment, management of knowledge is crucial, yet it is a challenge to measure it and to differentiate the typology required for knowledge productivity. This research develops a knowledge productivity scale for assessing individual knowledge activities of Knowledge Acquisition, Knowledge Sharing and Knowledge Transfer. This study looks upon to examine the individual role played by personality and intention factors in examining knowledge productivity behaviour amongst academics in Malaysia public universities, such that several of these threads are brought together.

Specifically, the author aims to establish how and whether academics with differing types of personality and attitudinal variables execute knowledge productivity behaviours to a different extent, including a consideration both of a global knowledge productivity outcome and also breaking it down into the more specific components of knowledge acquisition, sharing and transfer. This study explores knowledge activities of academics but also investigates the empirical data from academics via a quantitative data analysis of survey data from both time 1 and time 2, with a view to helping academics in Malaysia public universities to achieve improvement and effectiveness in their knowledge productivity.

1.4 Research Gap

Harrison and Kessels (2004) noted that "knowledge productivity concerns the way in which individuals, teams and units across an organization achieve knowledge-based improvements and innovations" (p. 145), while Stam (2007) argued that "knowledge productivity refers to the process of transforming knowledge into value". According to Jansink (2005), the concept of knowledge productivity is related with training and research activities. The followings are some of the significant ideas that led to many assumption and hypotheses which required to be researched. In reference to the literature reviews, there has been small number of research that focuses on individual knowledge productivity behaviours which influence academics'

research productivity in Malaysian universities, especially in mass University (UiTM has more than 14 branches). Due to the curiosity and interest of the researcher, it inspires the researcher to conduct this study. The researcher had focused on knowledge productivity in the education sector in Malaysia and has narrowed it to the public university segments. This is because public university segments in Malaysia bring strong research culture in the country.

1.5 Objectives

The key aims of this study include finding out the individual variables which influence academics in their knowledge production behaviours.

Overall, the objectives for this study are as follows;

1. To examine whether individual factors influence Knowledge Productivity Behaviour
2. To examine whether the relationships between Big Five Personality traits and Knowledge Productivity Behaviour are mediated through the variables of the Theory of Planned Behaviour, and whether personality has any moderating effects on the relationship between the Theory of Planned Behaviour variables and Knowledge Productivity Behaviour.
3. To formulate a model of Knowledge Productivity Behaviour among academics, with the specific consideration of individual differences variables (i.e., personality, attitudes, perceived norms etc.)
4. To examine the patterns of Knowledge Productivity Behaviour among academicians associated with factors such as gender, rank, teaching loads, etc.

1.6 Research Questions

In order to explore the relationship between individual disparities and knowledge productivity, the study poses four key research questions. The hypotheses to answer the questions have been formulated as follows:

1. What individual factors influence Knowledge Productivity Behaviour?

2. To what extent do the Big Five personality traits increase knowledge productivity?

3. To what extent are personality effects on knowledge productivity mediated through the Theory Planned Behavior variables?

1.7 Significance of the study/Anticipated Contribution

In sum, this study aims to make several contributions both at the theoretical and practical levels, particularly to our knowledge about the individual research productivity and performance of academics. It is hoped that these contributions will be useful in explaining the meaning and underlying concept of academics knowledge productivity behaviour, useful for improved management of the research process and for university administrators who have responsibilities to review and update research and publication policies and support.

More specifically, this study has the potential to provide theoretical insight into the relationship of the Big Five Personality traits (Big 5) with workplace knowledge productivity behaviours, with a specific focus on the academic research process and resulting knowledge productivity. Furthermore, the theory development and empirical results might help us to make conceptual progress on the issue of how broad personality characteristics (such as the Big 5) could impact upon performance outcomes by exploring potential mediating and moderating mechanisms that consist of the components of the Theory of Planned Behaviour (TPB), i.e., attitudes, subjective norms, perceived behavioural control and intentions. Importantly, these intervening variables are themselves more easily able to be changed or modified than broad aspects of personality, and thus offer additional opportunities for interventions to increase Knowledge Productivity Behaviour.

In addition, because this study focuses on the knowledge productivity behaviours of knowledge acquisition, knowledge sharing and knowledge transfer in the academic context, the measurement development undertaken in the study can contribute to future research on knowledge productivity behaviour. That is, scales measuring these three sets of behaviours were developed and have been tested in appropriate samples and their reliability and predictive validity were assessed. This potential knowledge productivity scale and measurement could be used for future research projects by other researchers in the area.

Furthermore, this study examines the extent to which key personality traits and attitudinal components relate to the knowledge activities of different academic staff, thus might provide some clues about how to improve their research performance. The outcome of this study can assist the university to develop a systematic knowledge management strategy to enhance the productivity of researches and to escalate the competitive capacity of the university. Study 1 data were collected in a Malaysian university system, where Faculty research productivity is

quite important as it has implications for government funding of the higher education sector in Malaysia, especially through the Ministry of Higher Education (MOHE). In addition, shedding light on the factors of success in leading to knowledge production may be helpful for other universities in different contexts as they work to develop strong academics by absorbing and understanding research management practices.

1.8 Limitations of study

A limitation of this study is that many situational factors are known to also affect whether faculty members can achieve high quality research publication. An attempt will be made to identify and measure such factors to the extent possible so that they can be used as control variables in the proposed model. In addition, due to the timeframe allocated for dissertation research, this study will focus on intermediate behaviours leading to the production of knowledge (e.g., the specific tasks involved in producing a study) rather than the ultimate outcomes of published papers and conference presentations. To further complement the study, it was decided that a second round of questionnaires should be added to the research design which would allow to compliment results between two different points in time and thus enable any disparity to be further investigated and potentially accounted for.

1.9 Structure of the thesis

This dissertation is structured into seven chapters that contain Chapter 1: Introduction, Chapter 2: Literature Review, Chapter 3: Quantitative Methodology, Chapter 4: Quantitative Analyses and Result, Chapter 5: Qualitative Methodology and Results, Chapter 6: Second data Analyses and Results and in the end of Chapter 7: Discussion and Conclusion. The following paragraph depict the essential structure of this study.

Chapter 2 presents the literature review focuses on the development of Malaysian higher education and research development of Malaysia universities. It provides an overview and understanding of the research allocation by the government. Following on from this the literature discuss the fields of knowledge productivity, Big Five Model and the Theory of Planned Behaviour. It critically discusses the theoretical frameworks that are used in the respective fields, which leads to a framework for the present study. Chapter 2 also elaborate on the hypotheses that are derived from gaps in the literature on knowledge productivity in Malaysia public universities.

Chapter 3 describes the quantitative methodology and the research design and procedure. This chapter begin with the ethical procedure, sample and data collection procedures and followed by quantitative instruments and measurements of Big Five, the Theory of Planned Behaviour and Knowledge Productivity Behaviour.

Chapter 4 presents the quantitative data analysis. This chapter presents the results of analyses of data that have been collected from the respondents. This chapter begins with the pilot study results and followed by the main study which consists of Social Science and Science and Technology sample. The hypotheses were also tested at the end of this chapter the discussion of the findings were presented.

Chapter 5 demonstrates the qualitative methodology and results. This chapter begin with the research design and procedure, ethical procedure, qualitative sample, data collection procedures, followed by qualitative data analysis results from the interview, and ended with discussion of the findings.

Chapter 6 presents the findings from follow up study Time 2 survey. The time 2 survey was collected approximately a year after the original data collection. It begins with the data cleaning process for the second data collection, and followed by overview results of Science and Technology sample and the results of second data of Social Science sample and ended with discussion of the findings.

Chapter 7 describes the discussion and conclusion on the major findings of this study, highlights the contributions that the study makes to the field of academic knowledge productivity and the limitation of this research and proposes areas for further research were presented.

1.10 Conclusion

This introductory chapter has outlined the background to this study; it has explained the purpose, aims, and the approach taken to conduct this research, along with the significance and potential contribution of the study to the field and the discourse around knowledge productivity has been.

CHAPTER 2: LITERATURE REVIEW

2.0 Introduction

In this chapter a variety of literatures relevant to the research problem are reviewed. I start with a brief overview in section 2.1 addressing the broad issue of why it is important from a societal standpoint to study how academics can be more productive in their research, that is, how they can be more productive in producing knowledge, focusing especially on the case of Malaysia (data are collected from faculty in the Malaysian university system). Next, I describe some key concepts and variables related to the issue of knowledge productivity. This is followed by more focused reviews of the primary theories that I will use to develop a set of antecedents to knowledge production, i.e., the Big Five Personality traits (Big 5) and the Theory of Planned Behaviour (TPB). As these latter two theories are reviewed, the research hypotheses are addressed.

To give a preliminary idea of the key concepts that will be presented in the literature review and research model, Figure 1 (below) provides a brief conceptual overview of the variables to be studied and their general sequencing. More specifically, the model proposes a selective set of: (a) direct effects of personality on Knowledge Productivity Behaviour; (b) indirect effects of personality on Knowledge Productivity Behaviour, with components of the Theory of Planned Behaviour serving as mediators; and (c) moderating effects of personality on certain relationships of the TPB variables with Knowledge Productivity Behaviour. The next section of this literature review will discuss in more detail the three sets of relevant variables and the proposed relations among them, starting with the focal dependent variable of Knowledge Productivity Behaviour (KPB).

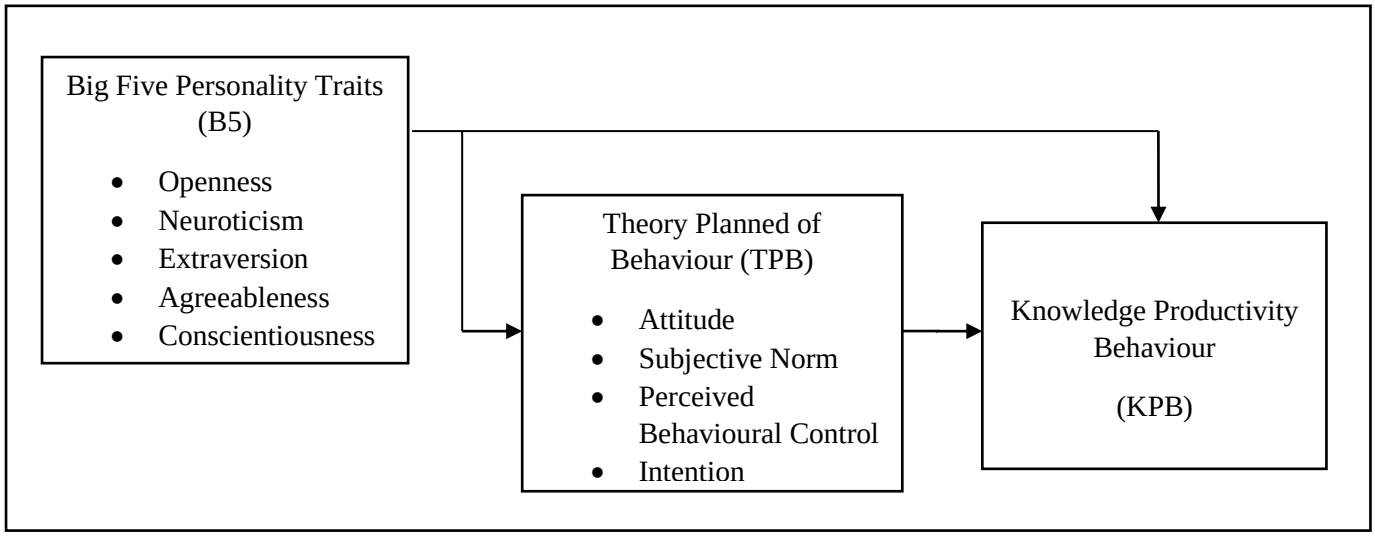


Figure 1. Conceptual Overview of a Model of Knowledge Productivity Behaviour (KPB)

2.1 Introduction: Background and Importance of Academic Research for the Malaysian Context

It is widely recognised that academic knowledge creation in the form of publication builds an universities rank and reputation, invigorates modernization and advancement, upgrades the nature of scholastic staff and improves the economic status of the organization (Azmi 2006). In the current study, the focus will be on understanding factors contributing to academic knowledge production in the Malaysian context, where it is acknowledged that Malaysia needs to grow its education sector. One key reason for this is to increase the nation's capability through research development and innovation. R&D activities are relied upon to help create existing industry by producing further innovative enhancements and in this way help to keep up intensity in the market (Wild, Bernstein, & Subramanyam, 2001). Another key reason is that research and development activity is expected to also help to raise standards and improve Malaysian universities. To provide relevant background for the emphasis in this thesis on academic knowledge productivity in Malaysian universities, before proceeding with a review of the theoretical literature I give an overview of the current state of Malaysian Higher Education in the next few pages, especially focussing on the years spanned by this thesis (i.e., 2015 through 2018).

In order to strengthen Higher Education, the Malaysian government continued the scholarship programmes with an allocation of RM288 million through the Ministry of Education and an allocation of RM250 million through the Ministry of Higher Education (http://www.pmo.gov.my/bajet2016/Budget2016.pdf), however, the budget does not break out exactly how much of this sum is specifically for research. According to the Universitas21 Ranking of National Higher Education Systems 2015, in 2015 Malaysia was ranked eighth globally for government expenditures on higher education. The nation was positioned 22nd for complete distributions and 33rd for productions per head of populace. The nation was positioned 32nd for the excellence of its best universities, and 39th for the instructive fulfillment of the workforce. In reality, the assessed generally speaking positioning score is around the dimension that would be normal at Malaysia's national salary level. However, in terms of the ranking of the universities themselves, in the global ranking, Malaysian universities have not performed excellently. Recently, only one institute was listed as Malaysia University in the Quacquarelli Symonds (QS) World Top 200 and only 6 universities in the Asian top 200. Of the set of Malaysian universities, University Malaya (UM) was listed as the highest ranking in the QS World Ranking (WUR) in 2015, however, it

can only attained number 146. Generally, though only two Malaysian universities are in the top 50, Malaysia is going for a better ranking. It would be valuable to determine ways in which the strong government investment in education could translate into higher rankings for Malaysian universities.

In the year 2017, the Malaysian Government invested heavily in its education sector, with a deep commitment to higher education. The Government allocates RM7.4b to 20 public universities, RM1.4b to four university hospitals, RM300m to five research universities. Overall in this budget, the administration has featured a RM100m examine support for advanced education foundations and RM4.3b to remain giving grants through the Public Service Department (RM1.6b), Majlis Amanah Rakyat (MARA) (RM2b), and Ministry of Higher Education (RM250m) (Take 5: Malaysia budget 2017). In the past 2017, the Malaysian Government put vigorously in its training division, with a profound responsibility regarding advanced education. The Government gives RM7.4b to 20 state funded colleges, RM1.4b to university hospital, RM300m to five research colleges. In this financial plan, the administration has featured a RM100m examine subsidize for advanced education foundations and RM4.3b to keep giving grants through the Public Service Department (RM1.6b), Majlis Amanah Rakyat (MARA) (RM2b), and Ministry of Higher Education (RM250m) (Take 5: Malaysia spending plan 2017).

According to Universitas21 in 2017, Malaysia was ranked overall at the 25th place. It combines the ranking of Resources at 11th, Environment at 13th, Connectivity at 34th and Output at 39th. As for higher education expenditure, Malaysia was ranked as 8th for government expenditure on higher education as a share of GDP while expenditure per student ranked 11th. In Connectivity, Malaysia was ranked 16th for knowledge transfer with business. However, joint publications with industry have ranked 50th while international collaborators have ranked 38th. In the meantime, the Malaysian institutions were ranked as 20th for the total publication and 31st for the publication per head of population. For the educational attainment workforce, the country has ranked 36th while the number of researchers in the nation has ranked 31st. Over the last five years, Malaysia has raised seven places for Output in the aspect of research and its impact, quality of the best institutions, and the production of educated workforce that meets the labour market needs. Indeed, it was the second highest improvement for the country. Overall, in taking account of the relative levels of GDP per capita, Malaysia's ranking has improved up to 19th and the estimated overall score near to the expected level of Malaysia's income level.

On average, the Malaysian education expenditure has doubled compared to other ASEAN countries. Presently, a sum of RM61.6 billion is provided for this sector and to be used for various purposes including the upgrading and maintenance of schools, aiding school assistance, higher education funder, offering "Skim Simpanan Pendidikan 1Malaysia"(1Malaysia Educational Saving Scheme), and upgrading the technical and vocational educational training. However, the specific amount of allocated budget for this field was not been mentioned in the recent 2018 budget (http://www.treasury.gov.my/pdf/budget/speech/bs18.pdf). This budget is still unofficial, as in Malaysia, an election will take place (probably in May 2018) after Malaysian Prime Minister Najib Tun Razak announces a parliament dissolution.

Table 2.1: Overall ranking of National Higher Education

Source, domain Universitas21	2014	2015	2016	2017
Malaysia				
Overall ranking of National Higher Education Systems	28 (53.4%)	27 (55.4%)	27 (55.4%)	25 (55.4%)
Measures by;				
Resources	12 (73.6%)	12 (73.5%)	14 (87.9%)	11 (86.3%)
Environment	26 (87.6%)	15 (88.7%)	15 (88.7%)	15 (88.7%)
Connectivity	33 (44.6%)	32 (46%)	34 (40.9%)	34 (38.2%)
Output	35 (20.8%)	44 (23.4%)	43 (24.8%)	39 (27.2%)
QS World Universities Rankings				
UiTM	701+	651-700	701+	701+

Noted. Sources from universitas21 & QS world university rankings

The report presents results for the Universitas 21 yearly positioning of national frameworks of advanced education involved fifty national frameworks of advanced education, from all continents, are assessed dependent on 25 characteristics. The characteristics are congregated into four modules: Resource, Environment, Connectivity, and Output. In term of resources, the measures are on (5%) government expenditure on tertiary education institutions, (5%) total expenditure on tertiary education institutions, (5%) yearly overheads per student (full-time equivalent) by tertiary education, (2.5%) expenditure in tertiary education institutions for research and development, and (2.5%) expenses use in tertiary training foundations for innovative work per head of populace. The environment was measured based on two surveys which were by the World Economic Forum (WEF) and four quantitative measures: the participation of female staffs and students, the diversity of institution in the system and the

quality of data relating to higher education. The presence of diversity encourages higher participation and stimulates competition. Meanwhile, data deficiencies indicate the lack of planning and evaluation on the system of higher education.

Connectivity involves the two-way flow of information between the higher education sector and the society. The value of a national higher education is enhanced if it associated with the nation's society and connected internationally for education and research. Connectivity promotes technical changes and economic growth as it measures the output used for this module which comprises of research output and impact, students' throughput, national stock of researchers, quality of nation's best universities, and graduates' employability (for further details http://www.universitas21.com/article/projects/details/153/executive-summary-and-full-2017-report).

QS World University Ranking is an annual publication of university rankings introduced by Quacquarelli Symonds (QS). Prior to their announcement of own version, it was previously known as Times Higher Education-QS World University Rankings due to its collaboration with the Times Higher Educations magazines (THE) to publish the international league tables from 2004 to 2009. Currently, QS system is encompassing of overall global and subject ranking (including top universities, 48 different subjects and combination of five faculty areas) as well as five independent regional tables (i.e. Asia, Latin America, Emerging Europe and Central Asia, the Arab Region). As the only International ranking receiver to receive International Ranking Expert Group (IREG) approval, QS ranking was seen as one of the three most-generally perused universities ranking globally alongside the Academic Ranking of World Universities and Times Higher Education World University Rankings. Currently, QS ranking is leading the higher education industry along with consistent innovation and growth. Furthermore, it has progressively affected the involvement of the students and the institutions. In the meantime, in its 13th years, QS ranking continues to produce authoritative, independent global rankings and has become the benchmark of evaluation of institutions globally.

Undeniably, the international ranking of Malaysian varsities has improved due to the government allocation for public universities' research grants. Based on the recent release of QS World Universities Rankings (QS-WUR) 2016/17, three Malaysian universities have climbed up to be in the top 300 of QS world ranking. Universiti Putra Malaysia has hopped 61 places and is currently ranking at 270th while Universiti Teknologi Malaysia has leaped

15 places to 288th. In addition, according to the QS rankings, Malaysia's Research Universities (MRUs) are in the top one percent in the world. Out of 26,000 universities worldwide, five MRUs ranked below 264th place. The five MRUs universities are Universiti Malaya, Universiti Sains Malaysia, Universiti Kebangsaan Malaysia, Universiti Putra Malaysia and Universiti Teknologi Malaysia. Within the last five years, these MRUs have improved significantly up to 184 places in the world rankings. This had proven great dedication and hard work done by the Malaysian higher education community.

Higher education institutions (HEIs) in Malaysia are under the jurisdiction of the Ministry of Higher Education (MOHE). Five of the 20 public universities in Malaysia (Universiti Malaya, Universiti Kebangsaan Malaysia, Universiti Putra Malaysia, Universiti Sains Malaysia, and Universiti Teknologi Malaysia) have been assigned research university status, as such, they receive additional funding for R&D and commercialisation of research. The Malaysia Blueprint reports (2015-2025) stated that some 70% of publications come from the five research universities, with lower levels of research production from other universities.

The remaining 15 public universities, including the site for data collection for the current study, Universiti Teknologi MARA (UiTM), have been categorised as either comprehensive or focus universities. Even though it is not classified as one of the research universities, UiTM is the largest university in Malaysia, with more than 8,888 academic staff, 180,000 students and more than 300 programmes offered at multiple locations. It is currently moving towards international and local university rankings and ratings. For 2015, UiTM were ranked 651-700 for QS-WUR, and 600 - 800 for THE. As, for ratings, UiTM achieved the following for 2014: Malaysian Research Assessment System (MYRA) (3 stars). At UiTM, Online Performance Appraisal System (OPAL) is currently being used as a tool to evaluate the performance of the academic staff. Apart of Quality of Teaching being assessed in OPAL, the UiTM OPAL also captures Quality of Supervision, Research activities, Publication record Consultant & Expertise, Conference and Innovation that contribute major impact to individual performance.

In 2016, the UiTM system was ranked 701+ by QS-WUR, and 601 - 800 by Times Higher Educations (THE). Meanwhile in 2017, UiTM's ranking has not improved and had fallen to the 800th place for THE and 701st place for QS-WUR. Yet, according to Quacquarelli Symonds (QS) Asia University Ranking 2018 report, UiTM has leaped 28 places to be ranked at 158th to become Asia's best university. Currently, 12 of its subjects appeared in the

QS World University Rankings 2018 and this has ranked it to be among the world's elite higher education institutions (NST, 2018).

According to the eighth edition list created by the global higher education analyst QS Quacquarelli Symond list contained the subjects of Architecture and Built Environment, Engineering (Chemical), Engineering (Mechanical, Aeronautical and Manufacturing), Engineering (Electrical and Electronics), Computer Science and Information Systems, and Agriculture and Forestry. In addition to the listing the other subjects included are Medicine, Pharmacy and Pharmacology, Chemistry, Accounting and Finance, Business and Management Studies, and Education. The posting likewise demonstrate that UiTM has enhanced in four subjects, specifically Social Sciences and Management (to 198th from 309th a year ago), Engineering and Technology (to 180th from 280th a year ago), Arts and Humanities (to 239th from 249th a year ago) and Life Sciences and Medicine, is also included and it has ranged between 451 and 500 for the first time.

According to the UiTM's Vice-Chancellor Prof Emeritus Datuk Dr Hassan Said, these subjects were listed based on four indicators of performance namely academic peer reputation, graduate reputation by employers, number of Scopus-indexed cited articles within five years and the H-index.

Discussing this further, Dr. Said indicated:

> *The H-index is a measure of scholars' productivity and citation impact in their own field…Overall, UiTM has shown an increase with a score of 326, which was mostly contributed by graduates' reputation according to employers and the H-index from Scopus…The increase in graduates' reputation indicator shows that employers' confidence in UiTM graduates continues to grow from year to year…Meanwhile, the increase in the H-index from Scopus shows that UiTM's academic staff has succeeded in producing quality research writing, which has become an international reference.*

However, in terms of World University rankings, according to QS the university did not move from the shared 701st spot from last year and according to THE it fell from its 600-800 place in 2016 into the 800 place, respectively. As one of the pioneer universities, and the largest university in Malaysia, UiTM made a good improvement in terms of their academic reputation, employer reputation and citations per faculty. Yet, it would be even delightful if the university could improve in terms of world university rank.

As for ratings, UiTM achieved the following for 2014: Malaysian Research Assessment System (MYRA) (3 stars). At UiTM, Online Performance Appraisal System (OPAL) is

presently being utilized as an instrument to assess the performance of the academic staff. Apart of Quality of Teaching being assessed in OPAL, the UiTM OPAL also captures Quality of Supervision, Research activities, Publication record Consultant & Expertise, Conference and Innovation that contribute major impact to individual performance.

Malaysian Research Assessment Instrument (MyRA) is a developed comprehensive system to access research capacity and performance of Higher Education Institutions (HEIs) in Malaysia. Since its development in 2006, its first objective was to attain the Malaysian Research University (MRU) agenda set by Ministry of Higher Education (MoHE) which was to identify five Malaysian universities for MRU award. Presently, National Higher Education Strategic Plan 2007-2020 has cherished the MRU agenda to raise the standing of public HEIs to achieve world-class status and to create differentiated higher education scenarios to comply with the country's socio-economic aspiration while being aware of the limited resources available to attain the objectives. Therefore, MyRA is used to monitor the public universities' research performance. At the beginning of 2014, all HEIs were assigned to play a part in the annual assessment exercise to correspond with the opening of MoHE research grants to all universities in Malaysia. Currently, MyRA includes 6-star rating system and all participating HEIs are Document-audited and Site-audited by trained auditors. Additionally, 27 auditors audited 58 HEIs between March and October 2015. Meanwhile, on 30th November 2015 at an inaugural gala ceremony, all HEIs that attained 3-star rating and above for 2014 MyRA assessment received congratulatory certificates from the Minister of Higher Education .

Therefore, the current research investigates potential individual difference factors affecting Knowledge Productivity Behaviour among academicians. It includes the Big Five Personality traits (Big 5) and Theory Planned of Behaviour (TPB) as factors influencing Knowledge Productivity Behaviour among academician in UiTM, Malaysia. Following an initial qualitative pilot study for the purpose of developing instruments, this study will use a descriptive survey to collect the relevant data to test the research hypotheses proposed in later sections of this document. The target population consists of academic staff of UiTM. The author hopes that this study will benefit Malaysian public universities by assisting them, they will be more inventive and creative to plan ahead to achieve world-class status as main point to attain advanced education in a perplexing global environment.The next sub section outlines the knowledge productivity in the study context of academic sector.

2.2 Knowledge Productivity

2.2.1. General background. Knowledge is defined as being comprised of justified beliefs and rationalized philosophy which enrich the organization's capability pertaining to successful action (Dev, 2010). As the total amount of information, knowledge and technological innovation grows rapidly, the world has become more knowledge-oriented. As indicated by knowledge-based perspective on the firm (Grant 1991, 1996; Spender 1996; Teece 2000), characterized that knowledge is the establishment of an organization competitive advantage and it is a definitive component of an organization value.

Many organizations now acknowledge the role that knowledge plays in creating and maintaining a competitive advantage (Drucker, 1993; Toffler, 1981). Indeed, knowledge has become the critical component in products and services (Savage, 1996), as illustrated in the following quotation.

> *"The most important contribution management needs to make in the 21st century is similarly to increase the productivity of knowledge work and knowledge workers. The most valuable assets of a 20th-century company was its production equipment. The most valuable asset of a 21st-century institution (whether business or non-business) will be its knowledge workers and their productivity" (Drucker, 1999).*

The idea of knowledge productivity and the concept of knowledge management are both founded on a knowledge-based view of organizations and economies. Summarising across works by Drucker (1999), Stewart (2002) and Stam (2007), knowledge economies (a) involve the buying and selling of knowledge, (b) acknowledge intellectual capital as the new wealth, and (c) have knowledge productivity (KP) as their biggest challenge. In a knowledge economy, KP is vital in making an organization successful (Keursten, Kessels, & Kwakman, 2003). Even when looking at knowledge productivity in non-academic contexts, such as in the manufacturing sector, the customary components of production, similar to regular assets, work and capital have lessened in significance. In the meantime the significance of intangible sources of info, similar to information and knowledge, have risen (Drucker, 1993).

Harrison and Kessels (2004) noted that "knowledge productivity concerns the way in which individuals, teams and units across an organization achieve knowledge-based improvements and innovations" (p. 145), while Stam (2007) argued that "knowledge productivity refers to the process of transforming knowledge into value". According to Jansink (2005), the concept of knowledge productivity is related with training and research activity. Knowledge production is a dynamic human process (Nonaka & Takeuchi, 1995). Behind the idea of knowledge productivity (KP) is the idea that knowledge is not only information but that its

effective use is contingent upon the competence of persons interacting with it (Malhotra, 2000), in order to innovate and improve products, processes, and services. Knowledge-productive involves acquiring new skills and attitudes to develop and maintain individual's personal competence.

According to Marsick and Watkins (2001), it is crucial to have meaningful work to access powerful learning environment and to remain valuable and productive for the society. Meanwhile, in previous empiral studies (e.g. De Jong, 2010; Keursten et al., 2006; Stam, 2007; Verdonschot, 2009) highlighted that empirical studies on knowledge productivity have presented concrete activities of knowledge production and different types of outcomes. These studies emphasized that knowledge activities require the establishment of work environment with good relationships between employees. Therefore, creating a powerful learning ambiance should be prioritized as an important field of action for human resource development in knowledge economy (HRD) (Kessel, 2004).

2.2.2. Knowledge productivity in the academic sector. Higher education institutions (HEIs) are a core medium for managing knowledge creation and dissemination in society. Generally, the role of academic staff incorporates educating, research activities, consulting and publishing all of which can include parts of knowledge productivity. When doing research and consulting, academic staff are knowledge producers. Through teaching, they play a role as knowledge disseminators to their students. Improved knowledge sharing practices will help the advancement of value education and furthermore will improve the present performance of the organization.

Knowledge productivity is a tricky construct. According to Machlup (1972), macroeconomic perspective had been adopted by few scholars to understand the knowledge productivity as a result. Meanwhile, Drucker (1981, 1993, 1999b) asserted that other scholars applied a managerial standpoint to decribe knowledge productivity as an individual capability. The present thesis incorporates the two points of view to characterize knowledge productivity as the ability of which individual, groups, and units over a firm accomplish knowledge-based improvements, utilisation, and developments (Drucker, 1993, 1999b; Harrison and Kessels, 2004; Stam, 2007). In the study context of the academic sector, knowledge productivity can be assessed by measuring the extent of academics' knowledge activities; Academics are expected to create, transform, translate and apply new and existing knowledge (knowledge activities) at a level that enhances competitive advantages and performance. To begin to think about what factors might be possible predictors of academic knowledge productivity, it is

helpful to think about the sorts of knowledge activities that must be undertaken in order for an academic to be productive.

To be more specific, academics can be productive in a variety of different ways. These include teaching at undergraduate and post-graduate levels, research publications, training, supervising post-graduate students on theses and dissertations, engaging in conference activities, public debates and similar outlets (Creswell, 1986). These activities may primarily involve individual efforts, but it is also the case that productivity will often take place in a social context, which must be managed. For example, many research projects involve team creations among co-authors, and perhaps also will involve others such as graduate students and research assistants. For purposes of the current study, academic knowledge productivity behaviours will be categorised based on existing literature as involving the three knowledge production activities of (a) knowledge acquisition, (b) knowledge sharing and (c) knowledge transfer. Each of these three categories is described in greater detail in the following paragraphs.

Knowledge Acquisition. Concisely, knowledge acquisition capacity denotes to the capability to recognize and gain new knowledge from external sources (Zahra & George, 2002). When considering the broader economy, acquisition of knowledge can be critical for the economic achievement of firms, and for the inventiveness and development of geographic regions (Grossman and Helpman 1991). Supported by (Cohen & Levinthal, 1990, Cui, Griffith, & Cavusgil, 2005; Zahra & George, 2002). Knowledge acquisition referring to an individual's capability to identify, obtain, and accumulate important new information, especially from sources external to the organisation. In addition, (e.g., Lane, Salk, & Lyles, 2001; Zhou, 2012) in their studies note that 'Individual knowledge acquisition capability' is likely a key factor for organizational success. Thus in academic settings, knowledge acquisition occurs when faculty actively bring new ideas from the outside into the institution (Rogers, 2000), and are able to craft existing knowledge into new knowledge (Lai & Lee, 2007). The incorporation of new internal and external knowledge significantly intensifies academician's innovative prospective and along these lines adds to a faculty personnel performance (Ettlie & Pavlou, 2006; Palacios & Garrigos, 2006).

To achieve improvement in efficiency and effectiveness these phases of knowledge acquisition involve processes of search, identification, and the absorption of potentially valuable knowledge from external sources (Stenholm & Bergsjö, 2015). In other words,

academics engaged in knowledge acquisition will be involved in activities such as reading scholarly publications, receiving training on topics that are related to the content or process of their research, and attending events such as conferences, seminar and discussions where new knowledge will be presented or developed. Thus, the construction of the dependent variable measure used in the current thesis will include relevant knowledge acquisition behaviours that fit the conceptual definition described in this section.

Knowledge Sharing. Knowledge sharing is decribes by which individuals, teams and the organization as a whole share both explicit and tacit knowledge with other organizational members (Zeng & Zhong, 2012). In other words, when there is undertaking of knowledge or information across individuals, knowledge sharing has taken place (Mansor, Mustaffa, & Salleh, 2015). The extent to which knowledge sharing occurs depends upon individuals' willingness to share the knowledge (Bock, Zmud & Kim, et al., 2005), and typically requires the mutual exchange (and perhaps joint creation of knowledge), thus implies a synergistic collaboration of individuals who work toward a common goal (Gagne, 2009). In brief, as defined in the organisational behaviour literature, Bartol and Srivastava (2002), explained that knowledge sharing occurs when members or individual in the organisation share organisation-related information, ideas, suggestion, skill and expertise with each other.

In the context of academics adopted in the current thesis, a similar definition would apply, although knowledge sharing would focus on information related to one's academic and research discipline, and would often cross the boundary of a specific university to be shared with other researchers in the same topic area at different institutions. The level of knowledge sharing can be influenced by several elements or factors. As indicated by Davenport and Prusak (1998), broad knowledge sharing inside organizations is as yet protected by the human tendencies or behaviour. As Bock et al. (2005) recommended, attitudes and subjective norms can influence the individual intention to share knowledge. Academics' involvement in knowledge sharing activities can also be seen as a result of a set of shared understandings that creates a social interaction culture that can encourage or discourage the exchange of knowledge, experience and skills. Supported by Rogers (2000), knowledge sharing occurs when people are able and open to share knowledge with others in order to encourage an innovative environment. Examples of academic knowledge sharing can involve a variety of forms of social interaction between individuals, including brainstorming between team members, academic meetings, talks, forums, conferences and seminars. In sum, for the

current thesis a measure of knowledge productivity behaviours will need to be developed, and should include activities that involve knowledge sharing, as discussed in this section.

Knowledge Transfer. In the more general, non-academic context, knowledge transfer is defined as to the identification and attainment of job-related knowledge which can be attained by exploring and exploiting or arrangement of transfer of main knowledge to other people who can conduct the similar duties. (Lai & Lee, 2007; Schulz, 2001). According to Disterer (2001), such knowledge transfer involves documentation and communication. For example, in business settings where knowledge transfer take place, knowledge is shared inside a firm across different functional groups, product families, geographical locations and timespans. Knowledge is likewise transferred between firms through interorganizational partnerships and linkages. In knowledge utilization, the firm incorporates and arranges its various forms of knowledge in order to take action and to produce products and services. (Wei Choo and Bontis, 2002, p. 37). Within the higher education setting, delivery and transmission of academic knowledge is commonly done through lecturing and documentation.

Knowledge transfer activities between universities are progressively crucial and vital in the higher education sector. They are the essential drivers for the country's economic and modernisation agendas as well as enhancing competitiveness and improving the quality of life. Department for Education and Skills (DfES) (2003), asserted that academic engagement has reflected in the activity and funding that has been introduced at the government levels (Lambert, 2003; DIUS, 2005, 2008). Furthermore, it has been supported by Department fof Trade and Industry (DTI) (2004) that academic engagement in knowledge transfer has progressively declared as a mean which HEIs contribute to their communities.

In order for transmitted knowledge to become useable, it has to be incorporated by the recipients into their existing knowledge structures. Thus knowledge transfer has only been successful when the recipients are able to use the new knowledge to generate new ideas and concepts that apply the transferred procedural and contextual knowledge skills. Knowledge transfer activities in academic settings likely encompass activities such as consultancy, contract or joint research (original research activities carried out by academics and commissioned by non-academic organizations or undertaken by both academic and non-academic organizations), providing of training and teaching which involves learning activities, the documentation as well as publication of explicit knowledge, and the diffusion of explicit and tacit knowledge spread to others (Abreu & Grinevich, 2013; D'Este & Patel,

2007; Molas-Gallart et al. 2002). Again, the dependent measure of knowledge productivity behaviours that is developed for use in the current thesis should include similar knowledge transfer behaviours as those discussed in this section.

In sum, the current study adopts a definition of academic knowledge productivity as the academician capability in creation and production of knowledge-based improvements, exploitation, and innovations through their knowledge activities. In the next section, a set of personality traits that may influence academicians' knowledge activities is described and reviewed.

2.3 Big Five Personality Traits (Big Five)

According to the American Psychological Association (2015), personality is described as *"individual differences in characteristic patterns of thinking, feeling and behaving*". Phares (1991) notes that there are two main focus in personality study; the first is understanding differences across individuals in specific personality attributes. The second is understanding how the different aspects of an individual come together as a whole to create a pattern of characteristic thoughts, feelings, and behaviours that distinguishes one individual from another and that persists over time and circumstance. Agnieszka (2013) indicates that personality is a set of traits that form a foundation for the stability and consistency of an individual's behavior. More directly, personality traits comprise of long-term tendencies or habitual patterns of behaviour, thoughts, and emotions. (McCrae &Costa, 2003). In brief, Cervone and Pervin (2010) stated that personality is defined as "*the psychological qualities that contribute to individual's enduring and unique patterns of feeling, thinking and behaving*". Meanwhile, Robert and Woodman (2017) in their studies stated that early Personality theorist, Freud Adler, Jung, and Reich, emphasized that personality is shaped across the lifespan and proposed that initial experiences will shape individual thoughts and behaviours.

In the current thesis, a goal is to determine whether such relatively enduring individual differences influence the extent to which individual academics engage in knowledge productivity behaviours.

2.3.1 General overview of the Big Five. In previous empirical studies, a number of independent groups of researchers identified five broad factors that represent a comprehensive set of traits which capture the main characteristics of personality. In the late 1950's, Ernest Tupes and Raymond Christal has improve the initial model, based on the

establishment work done at the U.S. Air Force Personnel Laboratory. This was followed by Lewis Goldberg in the 1980s, who started his own lexical project highlighting the five broad factors. Another major influence was the studies pursued by Costa and McCrae as illustrated in their 1985 publication of the NEO five-factor personality inventory. Finally, in 1992, J.M. Digman proposed his five-factor model of personality. There is some variation in details across the five factor models developed by different researchers, however, the models are very similar and agreed upon at a broad level. Various names are given to these models by the initial researchers, including the Five Factor Model or FFM, and the Global Factors of personality, which is the term referring to the Big Five traits (Russell, 1994).

John and Srivastava (1999), noted that the Big Five is a categorization or taxonomy of personality traits, in particular, a comprehensive arrangement of all of the traits which can describe an individual's personality. This has led to it being the dominant model used in psychology in studying personality differences of an individual across the life span (Costa & McCrae, 1992b, 1992c; Digman, 1990; Goldberg, 1990; John, 1990). The assessment of Big 5 personality traits is typically performed using self- or other-report instruments such as the Big Five Inventory. The five broad traits included in this model are extraversion, agreeableness, openness, neuroticism and conscientiousness. According to Costa (2000), these five traits are relatively stable and comprehensive, and empirical research has supported this claim.

According to (Schmidt & Hunter, 1998), to add incremental validity on traits assessments, personality inventories can also be used. Goffin et. al., (2011) asserted that personality assessment is urged to be used in employee selection as it guides the fundamental organizational objective selective of high-performing employees. There are five different personality inventories, or also known as Big5, which are conscientiousness, agreeableness, neuroticism, openness to experience and extraversion. Furthermore, it has been globally adopted for research and practice. Barrick & Mount, (1991; 2006) agreed and presented the research evidence which indicated that the Big5 are consistently related to the individual performance. For instance, selected employees with high conscientiousness level demonstrate the superior job performance across a range of jobs.

Prior research has discovered that individuals' personality traits are related to various kinds of individual behaviour in a wide variety of different situations, including music listening preferences (Rentfrow & Gosling, 2003), leadership behaviour (Judge & Bono, 2000), blood

donation behaviour (Paunonen & Nicol, 2001), gambling behaviour (Blaszczynski, Walker, Sagris, & Dickerson, 1999) and housing behaviour (Sweaney, Pittman, & Montgomery, 1984). Addition to that, in the field of consumer research, Goldsmith (2002) noted that consistent apparels purchasers have different personality traits compared with irregularly purchaser, whereas other research have noted the significant of the Big-Five to brand personality (e.g., Mulyanegara, Tsarenko, & Anderson, 2009; Tsu Wee, 2004).

Balderjahn (1988) identified personality characteristics that have distinct impact in the use of green and its consumption. Ramanaiah, Clump, and Sharpe (2000) discovered the differences in individual's personality traits scoring from high and low based on their environmental responsibility. Meanwhile, Fraj and Martines (2006) mentioned that different people with different personality traits react differently to the practice of green behaviour. Thus, few studies by Ciarrochi & Heaven (2008); Laidra, Pullmann & Allik (2007) Lesson, Heaven, Ciarrochi & Vialle (2007); Chamorro-Premuzic & Furnham (2005); Furnham, Chamorro-Premuzic & McDougall (2003) and Rindermann & Neubauer (2001) discussed the importance of personality in estimating individual's academic performance. Bigfive comprises of extraversion (social and active), openness (imaginative and intellectual), conscientiousness (persistent and dependable), emotional instability (anxious and unconfident), and agreeableness (cooperative and friendly).

The Big Five Model has frequently been used to predict job performance (Shaffer & Postlethwaite, 2012) and also academic performance (Poropat, 2009), two domains highly relevant to the current study. For example, according to O'Connor and Paunonen (2007), personality traits affect behavioural tendencies that in turn can influence academic achievement. In addition, in an extensive meta-analysis study, Barrick and Mount (1991) demonstrated reliable relationships across cumulated studies between personality and job performance, findings which have been repeated in more recent meta-analyses (e.g., Barrick, Mount & Judge, 2001; Oh, Wang, & Mount, 2011). Depending upon which personality dimension is examined and what the performance criterion is, personality sometimes has a positive impact and sometimes has a negative impact on the performance criterion.

According to Deci and Ryan (1985), intrinsically motivated students displayed various personality traits such as intellectual curiosity and tendency to disengage, compared to extrinsically motivated students. This indicated that individual's personality traits can be a favourable predictor of the academic outcomes. Meanwhile, Barrick & Mount, (1991)

highlighted that B5 model had broadly classified human personality into five major characteristics which are openness, conscientiousness, extraversion, agreeableness and neuroticism. Furthermore, each of these traits had been examined based on its relationship to academic achievement. In sum, personality variables, in particular the Big Five factors and their facets, have been strongly implicated in the academic success of students and work performance of employees, which suggests they might also be relevant to the research success of academicians.

2.3.2 Rationale, why personality traits especially Big Five. The broad justification had been suggested to evaluate the personality traits as a measure of academic performance. First, it has been suggested that the Big Five is the prominent and comprehensive model for capturing personality traits and this model has been used prominently in traits studies (Costa & McCrae, 1992; McCrae &Costa, 2003; Shaffer & Postlethwaite, 2012; Poropat, 2009; O'Connor and Paunonen (2007). This model has emerged as a robust and parsimonious model for understanding the relationship between personality and various academic behaviours (Poropat, 2009). Big Five traits (agreeableness, conscientiousness, neuroticism, extraversion, and openness) are commonly known as it presents the individual differences holistically in behavioural patterns (Costa & McCrae, 1992), and therefore is an appropriate theoretical framework for studying daily behaviour and performance in a wide range of domains.

Initially, the establishment of psychometrics instruments has caught many interests among the psychologists and educators to predict the individual academic achievement (see Busato, Prins, Elshout, & Hamaker, 2000; Goh & Moore, 1987; Savage, 1962; Willingham, 1974). Consequently, it was found that individual differences in terms of their personality traits and intelligence lead to the construction of theoretical and practical importance. From the theoretical aspects, intelligence and personality are to main variables that need to be considered as they provide a well-developed frame of reference to describe an individual and to identify particular similarities and differences between individuals. Meanwhile, from the practical aspects, the individual differences are significant as they can be utilized successfully for future behaviour such as in their academic and work performance (e.g. Cattell, 1987; Hofstee, 2001).

Yet this leads to the second argument for considering personality traits as key predictors of academic performance. Although intellectual ability certainly is relevant to whether or not an

individual is capable of becoming an academic, when making comparisons *within* a sample of persons whom are all academics it might be a much less relevant factor in the prediction of performance, as it is assumed that all academics would need to have met a certain minimal intellectual standard in order to secure the level of education needed for their positions. And, whereas an individual's ability to do something is referred to as intellectual ability, while an action that an individual will do refers to the individual's personal traits (Furnham & Chamorro-Premuzic, 2004). A long-term academic performance helps to provide a more accurate outcome that shows the expected common performances such as personality scale Goff & Ackerman, 1992).

A third reason for considering personality as an antecedent of academic performance is that the behavioural tendencies reflected in personality traits are believed to affect certain habits and ways of thinking which might influence on academic achievement. (Note that this third argument suggests there will likely be some factors that bridge between personality and performance, an idea returned to later in this chapter.) Rothstein, Paunonen, Rush, and King (1994) have argued that, ''to the extent that evaluations of performance in (an academic) program are influenced by characteristic modes of behavior such as perseverance, conscientiousness, talkativeness, dominance, and so forth, individual differences in specific personality traits justifiably can be hypothesized to be related to scholastic success,'' p. 517). Taken together, the three broad justifications outlined above provide a strong argument for our examination of personality variables as predictors of academic performance.

2.3.3 Application of the Big 5 in the current study. In the current study, the author adopts the personality traits from Goldberg's (1990) Big Five Model (Big 5) as independent variables used to predict knowledge productivity behaviour. More specifically, in this research model, an academic's personality -- as captured by the dimensions of openness, neuroticism, extraversion, agreeableness and conscientiousness -- is proposed to influence his or her tendencies to publish peer-reviewed papers in a high level journal. This approach is consistent with works (i.e., Ackerman et al., 2001) that suggest that determinants of educational achievement will likely change as time passes, from factors that reflect cognitive abilities, to factors that reflect personality or motivation. This is supported by Rothstein, Paunonen, Rush, and King (1994), it has been suggested that behavioural tendencies mirrored inside character features (i.e., personality) have an effect on particular habits that may influence academic achievement.

Laidra Pullmann, & Allik, 2007 and Poropat, 2009 in their studies found out that Big Five traits relate to academic performance. (Steel, Brothen, & Wambach, 2001) defined conscientiousness as a form of self-discipline and it has been associated with preparedness to facilitate schoolwork. Openness, such as imagination, is associated with the new modes of studying (Zeidner & Matthews, 2000). Agreeableness, such as compliance, helps to increase the class attendance consistency (Lounsbury, Sundstrom, Loveland, & Gibson, 2003). Extraversion, such as sociability, hinders students' focus (Bidjerano & Dai, 2007) while neuroticism, such as emotional inability, is associated with anxiety and can hinder the students' performance (Poropat, 2009). Rimfeld Dale, Kovas, & Plomin, (2016) claimed that empirical support for some traits prediction is stronger than other. For example, Conscientiousness was claimed to be the most reliable predictor of academic performance.

In the educational settings, several research has investigated the significant effect between the Big Five personality traits and academic performance. Across diverse educational context, personality traits have been applied to explain individual differences in undergraduate students' academic performance (Chamorro-Premuzic & Furnham, 2008). For example, Feyter et al. (2012) found that extraversion, neuroticism, and conscientiousness all influence academic performance indirectly through academic motivation, with some of these effects moderated by self-efficacy.

Big Five affect the students' academic performance and achievement. According to Conard (2006) and Chamorro-Premuzic & Furnham, 2003, conscientiousness continuously raised as a reliable predictor of academic performance. Its presence affected various educational outcomes and it was successfully predicted as relevant combinations of the Big5 personality traits. For instance, Paunonen & Ashton, (2001) claimed that when the traits of conscientiousness and openness combined, it may significantly predict course performance. Meanwhile, previous research (Poropat, 2005; Farsides & Woodfield, 2003), elaborated that agreeableness, conscientiousness, and openness were found to predict the overall academic performance. Furthermore, it has been discovered that openness, extraversion, and conscientiousness able to predict academic achievement specifically when prior accumulated knowledge have been applied in the real-life situation (Lievens, Ones, & Dilchert, 2009). However, Chamorro-Premuzic & Furnham, 2003, in their studies found out that academic performance can be influenced negatively due to emotional instability or neuroticism. Overall, these studies verify the significance of personality traits.

The next several paragraphs briefly describe each of the five personality traits, and develop a rationale for how they are expected to relate to academic knowledge productivity behaviour in the current study.

Openness reflects the degree to which an individual is an independent thinker, demonstrating creativity and innovativeness. Individuals with high levels of this characteristic show curiosity, and are willing to embrace new ideas as well as criticism and suggestions from others, and they accept either positive or negative values more intensely than individuals with lower values of openness (Costa & McCrae, 1992). This outcome affirms the discoveries of scholar, for example by Raudsepp (1990) noted that individual with high degree of openness demonstrate a dynamic creative ideas, mindfulness to internal emotions and an inclination for assortment, all of which clarify why they are evaluated higher on their work execution and imagination. The personality trait of openness contributes to effective leadership and company performance at management level. Managers, who are open, tend to generate ideas and willing to consider ideas from the others. In an approach to business problem-solving, it was viewed as assisting towards group success (Colbert et. al., 2012). Peterson et. al. (2003) suggested that CEO's personality influence the board level dynamic and financial performance. For instance, based on archival sources, CEOs with experience were perceived to be strong leaders who can encourage the top management of the team intellectual flexibility and responsibility to take the risk.

Lepine (2003) notes that individuals who possess high openness can easily adapt to changes and situations, consider and build up each other's ideas, and can look for alternative ways to solve problems they encounter. Moreover, individuals with this personality trait tend to be unconventional, willing to question authority and ready to entertain new ideas. According to Matzler et al. (2008), individuals with high scores on openness are likely involved in contributing to and seeking knowledge. Because academic knowledge productivity behaviour requires being creative and willing to experiment with new ideas and things, the author hypothesises that:

H1a. Openness has a positive relationship with Knowledge Productivity Behaviour.

Neuroticism contrasts with the other Big Five personality traits in its likely effect on Knowledge Productivity Behaviour. Individuals high in neuroticism frequently experience negative moods and unpleasant emotions such as anger, anxiety, or nervous tension. Individuals with excessive levels of neuroticism usually are reactive, being easily frustrated by perceived barriers in their environment. Individual with low emotional resources often

view events as threatening or negative and more prone to the stressors (Larsen & Ketelaar, 1991; Hemenover & Dienstbier, 1996). These people will use less compelling adapting method with less involvement of self-blame and respond immediately with hostile vibe (McCrae & Costa, 1986).

Thus, they more frequently turn out to be shaky, sad, worried, temperamental, and/or depressed (Heinstrom, 2003). The elevated anxiety and low self-confidence of individuals with neurotic personality characteristics may hinder them from being fully engaged in the learning process (Furnham & Chamorro-Premuzic, 2007). According to Rothmann and Coetzer (2003), individuals scoring high in neuroticism are prone to having irrational ideas, less able to control impulses, and cope poorly with stress. Because knowledge productivity behaviour requires logical and rationale behaviour, and often involves complex problems that need persistence and optimism to be solved, the author hypothesises that:

H1b. Emotional Stability has a positive relationship with Knowledge Productivity Behaviour.

However, note that the opposite end of the neuroticism dimension is called Emotional stability, and the personality measure that is used in this thesis is constructed so that the high end of the response scale indicates greater emotional stability. According to Eschleman et. al. (2010), emotional stability refers to the capability to stand with stress and to respond to resilience and optimism when encountered any challenges, changes, and uncertainties (Avey et al., 2008, 2011). Thus, carrying through on the logic of Hypothesis 1b, we would expect Emotional Stability to have a *positive* relationship with Knowledge Productivity Behaviour.

Extraversion is characterised by positive emotions and persons high in it tend to perceive their experiences as positive (Clark & Watson, 1991). Individuals who are high in extraversion tend to be passionate, active, sociable and talkative, as well as enthusiastic and energetic. Extraversion is one of the well-known personality descriptors. People who own this trait are usually lively, assertive and excitement-seeking individuals. Meanwhile, the opposite of this trait is called as introversion. Individuals with introverted characteristics tend to live more internally and often see as a quiet, reserved, self-reliant and even-paced individual (Costa & McCrae, 1992a). Yet, introverts may have more advantages than the extraverts in academic performances. Sanchez-Marin et. al. (2001) found that extraverts tended to fail in academic more frequently than the introverts due to their distractibility, sociability, and impulsiveness. In contrast, Furnham and Medhurst (1995) asserted that

academic tutors had claimed that extraverts are more positive in-class seminar compared to the introverts. Overall, research results showed mixed outcomes with some studies reporting on the negative correlations while others did not find any relationship or only small positive association.

Benek and Matthews (2004) found that learning is more effective when individuals are active and participating rather than passive. Persons high in extraversion are likely to be effective in teams, as they stimulate and encourage discussion (Mohammed & Angell, 2003; Taggar, 2002). Because knowledge productivity behaviour in academic contexts requires high levels of energy and also may require engaging with people, i.e., via research collaboration, public debates, and presenting at conferences, higher levels of extraversion may be beneficial. Thus, the author hypothesises that:

H1c. Extraversion has a positive relationship with Knowledge Productivity Behaviour.

Persons high in *Agreeableness* show high trustworthiness as well as being cooperative. Agreeableness has been proven to influence job performance, especially when collaboration and cooperation amongst peers is important (e.g., Mount, Barrick, & Stewart, 1998; Judge et al., 1999; Witt et al., 2002). Supported by Mount et al. (1998), employees who are argumentative, inflexible, uncooperative, uncaring, intolerant, and disagreeable (i.e., low in Agreeableness) are likely to be less effective at teamwork.

Agreeableness trait has facilitated interpersonal relation whereas conscientiousness studied the behaviour that boosts the academic achievement. However, Furnham et al., (2013) and Poropat, (2009), asserted that some researchers found a positive relationship between agreeableness and academic performance in the undergraduate samples while Noftle and Robins, (2007) and O'Connor and Paunonen, (2007) claimed that others did not establish any consistent relationship. In teamwork, agreeableness encourages group cohesion. Team with more agreeable members tend to perform better and encounter less team conflict (Barrick et. al. 1998). According to Peeters et. al. (2006), an analyst of numerous research studies, teams whose members score highly and similarly on agreeableness tend to perform at their best level due to their expectation of helpful team members. Overall, Neuman and Wright(1999) and another studies by Barrick et al., (2001) concluded that agreeableness is best to measure interpersonal effectiveness for roles which involves collaboration, cooperation and good relations with others.

As knowledge productivity behaviour can be viewed as a form of workplace helpfulness involving cooperation, collaboration and 'getting along with others', and because based on prior studies these characteristics are expected to assist interpersonal attraction and thus cooperation (Barrick et al., 1998), it might be expected that agreeableness has a positive relationship with knowledge productivity behaviour. However, in order to create new knowledge, individuals may need to take a stand against existing knowledge and ideas, which might be difficult for highly agreeable persons. Balancing these two conflicting arguments, the author hypothesises that:

> *H1d. Agreeableness may have both positive and negative relationships with Knowledge Productivity Behaviour. This might result in observations of an overall null (zero) association with KPB.*

Finally, *Conscientiousness* is the degree to which an individual is hardworking, dependable and engages in planning. Barrick and Mount's (1991) meta-analysis examined the validity of the Big Five for the prediction of performance, looking at various occupational sectors. A result in their study was that, going across all jobs and performance criteria, conscientiousness related positively to performance.To predict the employment performance for various kinds of professions, conscientiousness is crucial (Barrick & Mount, 1991; Schmidt & Hunter, 1998; Dudley et al., 2006) to be used as the measure as the concept of "conscience" refers to observing social rules and meeting moral obligations. An employee claimed to be conscientious is said to be dependable, efficient, productive, punctual, and thoughtful in the way they handle their task (Roberts et al., 2004) which can also be the traits of a powerful leader (DeRue et al., 2011; Judge et al., 2002). Individuals high in conscientiousness therefore are likely to be trusted by others to perform their task thoroughly (Liao & Chuang, 2004) and in general be known for commitment to their tasks and cooperating (Barry & Stewart, 1997) and showing effort and perseverance toward their goal (Lepine, 2003).

In addition, Conscientiousness is best viewed as the main predictors of academic achievement for all age groups such as in preschool, elementary school, high school, college and university students, (Noftle & Robins, 2007) and for adult subjects in additional training (Vedel, 2016; De Fruyt & Mervielde, 1996). It has shown high predictive outcomes on academic achievement for the past years. Moreover, it has reliably found to predict academic results and has been advanced in education behind the idea of "grit", which refers to as

aspiration and perspiration (Duckworth et. al., 2007). Conscientiousness traits can be related with the Big Five language, accomplishment endeavoring, which is a need to accomplish high standards, and self-discipline, initiate action, focused attention and determinants. This characteristic emerged as significant drivers of academic performance from O'Connor and Paunonen's (2007) meta-analysis of postsecondary education research studies. They evidence that overall Conscientiousness showed valuable and great relationship with scholarly achievement. Because academics may view research productivity as a requirement of their positions, we would expect knowledge productivity behaviour to relate positively to Conscientiousness. However, knowledge sharing could also be thought of as a form of organizational citizenship behaviour that entails dutiful deference to organizational interests and group norms (especially over self-interest and personal goals). This viewpoint also suggests that there would be a positive relationship between conscientiousness and KPB. Thus, the author hypothesises:

H1e. Conscientiousness has a positive relationship with Knowledge Productivity Behaviour.

In sum, based on the preceding literature review and synthesis, a set of hypotheses proposing relationships of the Big Five personality traits with Knowledge Productivity Behaviour have been formulated. These are listed below. The next section describes the potential role that the Theory of Planned Behaviour variables may play in linking the Big Five traits to knowledge productivity.

H1a. Openness has a positive relationship with Knowledge Productivity Behaviour.

H1b. Emotional Stability has a positive relationship with Knowledge Productivity Behaviour.

H1c. Extraversion has a positive relationship with Knowledge Productivity Behaviour.

H1d. Agreeableness may have both positive and negative relationships with Knowledge Productivity Behaviour. This might result in observations of an overall null (zero) association with KPB.

H1e. Conscientiousness has a positive relationship with Knowledge Productivity Behaviour.

2.4 Theory of Planned Behaviour (TPB)

It is likely that personality has its effects on behaviour by directing attention, influencing intentions, and influencing motivational states. Thus it was important to find theory that links personality with behaviour by suggesting what those important mediating components might be. In addition, identifying mediators is important for considering future change efforts, as personality may be more difficult to change than the mediating motivational components. The proposed mediating variables in the current study are drawn from the Theory of Planned Behaviour.

The historic roots of the Theory of Planned Behaviour (TPB) are in the 1980s, contained in the set of ideas then known as the Theory of Reasoned Action (TRA) (Fishbein & Ajzen, 1967.). This theory was proposed in order to predict an individual's intention to engage in a specific behaviour at a particular time and setting, based upon their attitudes and subjective norms. The Theory of Planned Behaviour was developed by Icek Ajzen in 1988, and built upon the original TRA by adding the variable of perceived behavioural control (PBC).

Human behaviours are shaped based on three considerations. First, behaviours are shaped based on the beliefs of normative expectations from others and require motivations to obey these expectations. Second, behaviours are shaped based on the beliefs about the results of the behaviour and the evaluations of these outcomes (behavioural beliefs). Third, behaviours are shaped based on the belief about the presence factors may help in the behavioural performance and the perceived power of these factors (control beliefs). Ajzen (2002) believed that behavioural beliefs produce positive and negative attitude towards behaviour while normative beliefs result in alleged social pressure or subjective norm. Meanwhile, control beliefs lead to perceived behavioural control. However, a combination of attitude towards behaviour, subjective norms and perception of behavioural control lead to the formation of behavioural intentions. Ajzen (2002) also claimed that positive attitude, subjective norms, and greater perceived control may significantly affect the person's intention to perform the behaviour. Overall, people carry out their intentions when the opportunity arises and when they were given sufficient degree to control over their behaviour.

Currently, TPB has been significantly used to predict the intentions and behaviours throughout various context of study (Harrison, Mykytyn, and Riemenschneider, 1997, p. 172). It was suggested by the Theory of Planned Behaviour that specific behaviour results can be seen when an individual has a solid grasp of behavioural intentions for themselves.

Thus, it can be concluded that the quality of behaviour intentions rely on three factors which are the disposition of a person's attitude towards behaviour, subjective norms, and perceived behavioural control (Ajzen, 1991).

Empirical tests and rational for using the Theory of Planned Behavior. TPB have been applied to several domains to get better insight of the individual's intentions and behaviour. Hrubes and Ajzen (2001) applied TPB as a way to forecast hunting behaviour whereas Beck used it to measure dishonest actions. Meanwhile, Astrom and Mwangsi (2000) applied TPB to measure the teachers' intention to give dietary consultation. Norman applied it to predict the breast self-examination while Norman and Hoyle (2004), expected to see the students' intentions to quit smoking. On a bigger scale, various studies related to information system applied TPB to foresee the use of technology ((Morris et al., 2005; George, 2004).

This study adopts the Theory of Planned Behavior is known to be as a theoretical basis to explain and predict the influences that can motivate the individual's knowledge sharing behaviour. TPB was also claimed to be have better explanation on the actual behaviour than the TRA and was highly chosen over TRA. Approximately around 19 to 38 % of intentions were inconsistent (Rivis and Sheeran, 2003) with the actual behaviour and attitude whereas the subjective norms were between 33 to 50 percent difference in intention (Ajzen, 1991; Armitage & Conner, 2001; Sheeran & Orbell, 1998). However, the accounted variance may be increased by 5 to 12 percent with the addition of PBC construct (Ajzen, 1991; Armitage & Conner, 2001; Conner & Armitage, 1998; Sheeran & Taylor, 1997) and the actual behaviour's accounted variance may rise by 2 to 12 percent (Armitage & Conner, 2001; Godin & Kok, 1996). The concepts of constructed PBS are based on the resources, ability, and opportunities to demonstrate behaviour.Generally, facilitating settings for example resources, ability, time, and opportunities are essential in determining knowledge sharing behaviour.

Mutaz (2013) notes that previous studies from many disciplines and on many topics have applied the theory of planned behaviour to predict various human behaviours, comprising fields varies from sociology (Kim & Karpova, 2007), information systems (Huang & Chuang, 2007), management (Ye, Chen & Jin, 2006), computer science (Siponen, 2000), to marketing (Kalafatis, 1999) and many more. Additionally, in the technology acceptance and literature, the relationship between attitude and intention has been reliably acknowledge (e.g., Dickinger, Arami, & Meyer, 2008; Titah Riyadh & Henri Barki, 2009; Zhang, Aikman, &

Sun,2008; Zhang & Sun, 2009). And according to Ajzen (2011), the Theory of Planned Behaviour has become broadly adopted as one of the strongest predictors of customers' behavioural tendencies. Therefore, the use of TPB in the knowledge productivity context is appropriate.

Consistently with the topic of the current thesis, in the past literatures of knowledge sharing, behavioural intention is influenced positively by the attitude when sharing the knowledge. (Bock, Zmud, Kim, & Lee, 2005; Kolekofski & Heminger, 2003). Moreover, Kim and Adler's (2015) study demonstrated that attitudes and attitudinal beliefs toward data sharing and the perceived availability of resources influence information sharing behaviours.

The Theory of Planned Behaviour recommends that individual's intention to perform a particular behaviour depends on his or her attitude towards the behaviour in line with the subjective norms and perceptions towards behavioural control. (Ajzen, 1991). In the current thesis, I adopt Ajzen's (1991) Theory of Planned Behaviour (TPB) as a theoretical base. In this research model, an individual's intention, attitude, subjective norm and perceived behavioural control determine his or her intention to engage in knowledge production behaviours that are expected to eventually lead to the publication of a peer-reviewed paper in a high level journal or a conference presentation. These ideas are further developed in next several pages.

Intention. Intention is functional to individual's attitude to a particular behaviour. It is also a subjective norm towards the behaviour and the amount of it will perceive his or her control over the behaviour which the determinants are weighted for its' brings significant relation to the behaviour. An individual's readiness to involve in a behaviour is basically depending on the intention. According to Ajzen (1991), the stronger the intentions, the more likely you will see the actual performance of the behaviour. Thus, it is crucial to study the matter of intentions towards a behaviour.In turn, intentions ''*can be predicted with high accuracy from attitudes toward the behavior, subjective norms, and perceived behavioral control"* (Ajzen, 1991).

For purposes of the current study, intention is defined as individual's aim to engage in in knowledge productivity behaviours such as doing research, publishing papers on their work and attending academic conferences to give talks on their findings and to find out what others in their fields have learned. Thus, we would expect that intention indicates a knowledge worker's readiness to engage in knowledge productivity, such that people's intention to share

knowledge is a determiner of these desired behaviours (e.g., Ryu et al.,2003), and that. According to Lin and Lee (2004), as one of the major element in the TPB framework, the intention to share knowledge has affected significantly on the knowledge sharing behaviour. It has been shown in the previous studies' that the findings revealed positive effects on the intention of knowledge sharing behaviour.

Most higher education institutions are keen that their academics produce the highest quality publication output; excellence in research will be evidenced by the advancement of general both and growth in reputation of the academics. As producing publications is one of the requirements and can bring benefits in the academic life, greater knowledge productivity can be attained when an individual intention to produce knowledge is consistent with TPB.

Thus it is hypothesized that

> *H2a. Intention to engage in research activities has a direct, positive effect on Knowledge Productivity Behaviour.*

Attitude. In the TPB model, an attitude towards a behaviour is based on behavioural beliefs. Behavioural beliefs are expected concerns such as positive and negative evaluation from a specific behaviour. Attitude in this study is related to the amount of preference that an individual has either favourable or unfavourable towards the process of publishing and presenting. Generally, the more likely you are towards the behaviour, the stronger the individual's intention will be to perform the behaviour (Ajzen, 1991). Gagne and Medsker (1996), mentioned that attitude is an internal matter that affects an individual's preference of action or responses. For instance, an attitude in a teamwork can be well-defined as the willingness (internal state) to consistently working cooperatively with the same and other teams (personal action) (Gardner and Korth, 1998).

According to De Vries et. al., (2006), personal factors and knowledge sharing intention can be facilitated by attitudes. Moreover, a person's evaluation of particular behaviour is influenced by attitudes (Blue et. al., 2001). According to Sun and Scott (2005), attitudes are a major part of a cognitive system and it can influence the intention of sharing knowledge. Research on attitude has been emphasized due to the belief that attitudes have impacts on individual's behaviour (Wolcott et al., 2002), through behavioural intentions and can be shaped by the environment. Thus, appropriate interventions should be designed to align the

attitudes to achieve the desired impact on behaviour. Meanwhile, Wolcott et. al. (2002), view that it is crucial to align the educational environment to the intended critical thinking outcomes and students' characteristics to attain effective educational interventions to enhance the students' critical thinking skills.

In a number of domains it has been demonstrated that attitudes have made significant contributions to the prediction of behavioural intentions (Sheeran & Orbell, 1999). For example, Sergio et al. (2010) notes in his studies that attitude was the most influential variable in predicting an individual's intention to provide an online review. In the academic context, knowledge productivity behaviour is a particular practice of academics, where publication output has a big implication for the academics' career. A more positive attitudinal disposition towards knowledge productivity should increase knowledge productivity intention. This leads us to expect that attitude will have a strong influence on intention and via intention, on behaviour. Thus, the author hypothesized that:

> *H2b. Attitude towards publishing/presenting has a (i) positive, direct effect on behavioural intention and (ii) a mediated effect on Knowledge Productivity Behaviour (via behavioural intention).*

Subjective norm in the context of TPB is defined as the need to act according to what others think you should do which brings the whole concept of being internally controlled.although norms would typically have some basis in the social interactions with others. Norms comprise of an individual's convictions about whether other people who are significant think about involvement in the behaviour. Subjective norms comprise of two components to work in interaction which are 1) belief about how other people would react or behave and 2) the positive and negative judgements about each belief. Subjective norm in the current study is defined as the degree to which an individual perceives that being engaged in research activities aimed at publishing/presenting is held as a social norm among people who are important to him or her. According to Baker, Said and Hubona (2007), the Theory of Planned Behaviour interpret role of social pressure to be progressively significant when the motivation to conform to that pressure is more prominent. Subjective norms can be associated to the consumer's perception to love for the brand due to the acceptance, encouragement, and implementation based on the influence of the consumer's circle.Meanwhile, Karjaluoto (2016) asserted that purchasing power are gradually influence by colleagues reviews.

Badingatus Solikhah (2014) notes that intentions are influence by several external factors such encouragement from parents, spouse and teachers.

Ryu et. al., (2003) and Lin and Lee, (2004), noted that several studies has proven that subjective norms show an important relationships with knowledge sharing intention.In addition to Blue et. al., (2001), subjective norms were perceived to have an influence on the intention and behaviour and acted as an indicator of individual willingness to comply with others. Meanwhile, Sun and Scott (2005), highlighted that subjective norms play a crucial role in developing their intention to share information as individuals prefer to be recognized and acknowledged by others.

When applying TPB in the academic context, I suggest that subjective norms from two different sources be assessed, namely, norms associated with peer influences (i.e., colleagues) and those associated with a superior's influence (e.g., Dean/ Head of Department). Thus, the author hypothesized that:

> *H2c. Subjective Norms about academic productivity pressure (i.e., peer and superior) have a: (i) positive direct effect on behavioural intention and (ii) a mediated effect on Knowledge Productivity Behaviour (via behavioural intention).*

Finally, *Perceived behavioural control* has been used in the TPB literature to refer to "the perceived ease or difficulty of performing the [target] behavior" (Ajzen, 1991, p. 188). The roots of perceived behavioural control are "*assumed to reflect past experience as well as anticipated impediments and consequences*" (p. 122). Perceived behaviour control has been conceptualized as not only affecting behaviour through intentions, but as also having direct effects on behaviour (Ajzen, 1991). It is determined by the individual's beliefs about the power of both situational and internal factors to facilitate the performing of the behaviour (Syed & Nazura, 2011). More specifically, individual's perceived behaviour control can be determined based on an individual's perception of the available skills, resources, and opportunities, and based on the assessment done on the importance of those skills, resources, and opportunities to demonstrate a particular behaviour (Mathieson, 1991). In simpler meaning, the presence of PBC can be a factor that facilitate or delay the process to perform the behaviour (Ajzen, 2005). Ajzen (1991, 2005) mentioned that a person is probable to exhibit major perceived behavioural control when a person is determined that s/he possesses the skills, resources, opportunities, and involved in various obstacles or impairments.

Previous studies by Blue et al., (2001), Ryu et al., (2003) and Lin and Lee, (2004), claimed that PBC is one of the main variables in knowledge sharing behaviour studies. Lin and Lee (2004) discovered that perceived behavioural controls have positive effects on sharing knowledge intentions. Meanwhile, lack of perceived behavioural control may affect the intention to share knowledge negatively (Ryu et. al., 2003). Overall, individual's intention to perform behaviour is based on the perception of his/her level to control that behaviour (Blue et. al., 2001).

In the context of the current thesis, Perceived behavioural control is defined as the degree of ease or difficulty perceived by an individual with respect towards engaging in the behaviours necessary to achieve a publication/presentation. The more the control an individual feels about engaging with scholarly activities, the more likely he or she will be to intend to do so, as well as to actually do so. Thus, the author hypothesized that:

H2d. Perceived Behavioural Control towards capabilities in publishing has positive effects on Knowledge Productivity Behaviour, both (i) directly, and also (ii) indirectly through behavioural intention.

From the preceding discussions this study has formulated hypotheses which proposed the relationship of the variables of the Theory of Planned Behaviour with Knowledge Productivity Behaviour, more specifically:

H2:

H2a. Intention to engage in research activities has a direct, positive effect on Knowledge Productivity Behaviour.

H2b. Attitude towards publishing/presenting has a: (i) positive, direct effect on behavioural intention and (ii) a mediated effect on Knowledge Productivity Behaviour (via behavioural intention).

H2c. Subjective Norms about academic productivity pressure (i.e., peer and superior) have a: (i) positive direct effect on behavioural intention and (ii) a mediated effect on Knowledge Productivity Behaviour (via behavioural intention).

H2d. Perceived Behavioural Control towards capabilities in publishing has positive effects on Knowledge Productivity Behaviour, both (i) directly, and also (ii) indirectly through intention.

2.5 Relationship of Big Five and Theory of Planned Behaviour (TPB)

The current thesis proposes that both the Theory of Planned Behaviour (TPB) and personality are necessary factors to consider when explaining academic knowledge productivity behaviour. The TPB literature notes that variables external to the TPB also can have important influences on behaviour, and that the TPB may play in a role in explaining or mediating the process by which external variables influence intention or behaviour. For example, personality can be an external construct for which the TPB may play an important mediating role (Ajzen, 1988). This is supported by Chatzisarantis and Hagger (2008), who studied participation in physical activity, and argued that the theory of planned behaviour does not capture all variance in their outcome that can be explained by antecedent variables, and that personality traits may improve the predictive validity of the model.

Preceding studies (Rhodes, Courneya & Jones, 2002; Conner & Abraham, 2001; and Courneya, Bobick & Schinke, 1999) utilized personality variables as antecedents to the TPB component in predicting health-related and exercise behaviour. Courneya et. al., (1999) studied to determine whether TPB can fully facilitate the personality exercise behaviour as predicted or not. The result of hierarchical regression analysis displayed that intended on three TPB components, exercise was regressed with 42 percent of each variance was elaborated in each components of significant variances. Meanwhile, McRae and Costa (1987), highlighted that addition of the Big Five factors such as extraversion, neuroticism, and conscientiousness failed to add significant variance to support full mediation hypothesis. Yet, in previous studies, extraversion displayed a direct and positive relationship between intention to exercise and actual exercise behaviour. Surprisingly, Rhodes et. al., (2002) discovered similar findings on exercise behaviour when using structural equation modeling using female college students as sample. Meanwhile, using the similar modeling, Conner and Abraham (2001) discovered that higher level of conscientiousness is related to more positive attitude towards health protection which then can predict the intentions to protect individual's health. In other words, the effects of conscientiousness were fully mediated based on the attitude towards health protection while the direct effect on behaviours was partially mediated. All in all, these studies suggested that neuroticism, conscientiousness, and extraversion are the logical personality that was constructed to predict health protection and exercise behaviour, except for extraversion as it may require full mediation by TPB components.

Previous studies (i.e., Furnham & Heaven, 1999) stated that Big Five suggests that traits or combination of them are essential determinants of behaviour and as well there is substantial evidence linking personality together with behaviour. While many studies stated that an individual's behaviours can be explained by personality traits (e.g., Viswesvaran, & Schmidt, 1993; Barrick & Mount, 1991; Ones, Tett, Jackson, & Rothstein, 1991 and Hough, Eaton, Dunnette, Kamp, & McCloy, 1990), the Theory of Planned Behaviour has been a powerful tool in predicting essential individual behaviours in a diverse variety of fields (Harrison, Mykytyn, & Riemenschneider, 1997). Moreover, Gordon and Modi (2015) found personality traits to be positively related to behaviour, and their finding is consistently supported with other research (e.g., Hirsh, 2010; Hirsh & Dolderman, 2007; Korotkov, 2008; Markowitz, Goldberg, Ashton, & Lee, 2012).

2.5.1 Evidence for the Theory of Planned Behaviour (TPB) as a mediator. In general, by integrating personality and TPB, the researcher concluded that it is a productive strategy. (Conner & Abraham, 2001; Phillips, Abraham, & Bond, 2003). Personality theory has suggested that traits, or the combination of various traits, can be determinants of behaviour (Costa & McCrae, 1995). For instance, in the exercise context, traits are connected to the exercise with indirect properties through the TPB and direct impacts on behaviour (Rhodes, Courneya, & Jones, 2005; Conner & Abraham, 2001; Courneya, Bobick, & Schinke, 1999). In general, personality trait is defined as universal dimensions of diverse individual differences by displaying continuous patterns of thoughts, feelings, and actions (McCrae &Costa, 1990) are considered to be concepts external to the TPB. However, there may be links between traits and the TPB variables. Looking at the past literatures, personality traits might be determinants of specific behaviours, for which the TPB variables may play an important mediating role.

Other researcher in the past (Rhodes, Courneya & Jones, 2002; Conner & Abraham, 2001; Courneya, Bobick & Schinke, 1999) applied personality variables as antecedents to the TPB components for the prediction of health-related and exercise behaviours. However, recent research that examines the mediating effect of TPB between personality and exercise behaviour among younger females showed that TPB is insufficient to complete the effects of personality on behaviour. Therefore, the model tested in the current study will allow both direct and indirect, mediated effects of personality on behaviour (Courneya, Bobick, & Schinke, 1999). Three past studies (Rhodes & Courneya, 2003; Courneya, Bobick, & Schinke, 1999), Rivis et al. (2011) had also looked at the role of Big Five personality traits in

the context of TPB. In some studies, personality traits provide relevant background factors in TPB. Studies by (Conner & Abraham, 2001; Picazo-Vela, Chou, Melcher, & Pearson, 2010) highlighted that conscientiousness was related to intentions and behaviour. Thus, the model tested in the current study will allow both for indirect, mediated effects of personality on behaviour (i.e., through the TPB variables), as well as direct effects of personality on behaviour.

2.5.2 Evidence for the Big Five as a moderator. Personality variables may also become the moderators of TPB effects. According to McCrae and Costa (1995), and McCrae et al., (2000), described personality as the extents of person dissimilarities and pattern to display of thinking, feelings, and engagements. It was also hypothesized that it represented a biological influence towards culturally conditioned phenomena, behaviour and life's events. Meanwhile, past studies, (e.g., Rhodes & Courneya, 2003a; Rhodes, Courneya, & Jones, 2002b; Conner & Abraham, 2001; Biddle, Soos, & Chatzisarantis, 1999; Courneya, Bobick, & Schinke, 1999; Rhodes, Courneya, & Jones, in press) added that direct personality on exercise intention and behaviour had received significant research attention. However, studies on personality moderators of the TPB variables effects have been scarce in any behavioural domains.

According to Synder (1974), self-monitoring affects interaction in terms of individual's expressive behaviour. Meanwhile, Previous research has demonstrated the construction of TPB (see Prislin & Kovrlija, 1992; Rhodes & Courneya, 2000), only comprehensive studies of personality were conducted and acted as moderator of TPB (Rhodes, Courneya, & Hayduk 2002a). In his study, five-factor personality model was systematically examined for moderating effects on TPB in the exercise area. Rhodes et. al., (2002a) determined the moderators of attitude-intention, subjective norm-intention, and intention-behavior relations.

The study highlighted that specifically neuroticism, which is the tendency towards negative effects and self-reproach, and extraversion, which is the tendency towards being sociable, assertive and adventurous, would moderate the impact on subjective norm-intention. It discovered that those individuals with higher neuroticism and lower in extraversion have stronger subjective norm-intention compared to the less neurotic and more extroverted counterparts. Meanwhile, conscientiousness, which is the tendency to be orderly, reliable, self-disciplined, and ambitious, moderated the effects of attitude-intention relationship. It was elaborated that individuals with lower conscientiousness may possess stronger effects than

the highly conscientious individuals. Lastly, the combination of extraversion and conscientiousness may moderate the intention-behaviour relationship. It was presented those individuals with higher level of these personality traits tend to have stronger effects compared to the less extraverted and less conscientious individuals.

By combining the personality traits, it helps to reduce the differences between the intention and behaviour. Furthermore, predictive ability of the intention on user's behaviour can be increased (Rhodes & Courneya, 2003; Corner & Abraham, 2001; Courneya et al., 1999). Furthermore, whether behavioural intentions predict specific behaviour may depend on "individual difference" factors or personality traits (Wong & Sheth, 1985). Theoretically, this type of moderator effect by having a conceptualization that had been established by Adler and Matthews (1994), the moderator effect will be consistent. In their model, personality has impacted the health status through the effect of social environment such as stress, through continuous health practices, psychophysiological mechanisms, and health status. Theoretically, it is better to clarify if personality influences this relationship whether with or without addition of direct effect on health practices. Implicit within this model is personality's moderated effect on the relationship of stress with health behaviours. In light of their study, it is sensible to inquire as to whether trait additionally moderates this relationship, separated or notwithstanding its immediate or primary impact on health exercise (Harakeh, Scholte, de Vries, & Engels, 2006).

According to Shropshire, Warkentin and Sharma (2015), several factors of personality have been recommended as the possible moderators between the intention-behaviour relationships. For instance, several personality traits may justify the reason behind why certain individuals will act based on their intentions. Direct effects of personality on intentions and behaviour have received substantial research attention in many behavioural domains (e.g. exercise domain consider works by Rhodes & Courneya, 2003a; Rhodes, Courneya, & Jones, 2002b; Conner & Abraham, 2001; Biddle, Soos, & Chatzisarantis, 1999; Courneya, Bobick, & Schinke, 1999), but investigation focused on personality moderators of the TPB has been scant in any behavioural domain.

Interaction has an impact on the individual's self-monitoring (Snyder, 1974). The nature of controlling expressive behaviour on TPB has been exhibited in previous research (Prislin & Kovrlija, 1992; Rhodes & Courneya, 2000) with only comprehensive personality was studied as the moderator of TPB. In order to examine the moderating effects on TPB in exercise

domain Rhodes, Courneya, and Hayduk (2002a)., the five-factor model of personality has been widely used and claimed to be the structure of basic personality. Rhodes et al. (2002a) discovered the moderators are attitude-intention, subjective norm-intention, and intention-behaviour relations. Particularly, neuroticism portrays negative affect and self-approach whereas extraversion has the tendency to show being sociable, assertive, and adventurous. Individual's with higher neuroticism and lower in extraversion will show stronger subjective norms relations that the vice versa counterparts.

Conscientiousness shows the tendency to be organized, reliable, self-disciplined, and ambitious that moderates the affective attitude-intention relationship. Individuals with lower conscientiousness have stronger impact that the opposite counterparts. Consequently, both extraversion and conscientiousness altered the intention-behaviour relationship whereby individual's with higher of these traits has stronger impact compared to the less extraverted and less conscientious individual. In addition, conscientiousness and/or extraversion act as moderators to intention-behaviour relationship which higher in these traits will lead to wider intention-behaviour relations (e.g., Chatzisarantis & Hagger, 2008; Conner, Rodgers, & Murray, 2007; Rhodes et al., 2007; Rhodes, Courneya, & Hayduk, 2002).

Considering the preceding discussions as well as the current study context, several hypotheses were formulated which propose joint relationships of Big Five and Theory of Planned Behaviour (TPB) with Knowledge Productivity Behaviour. Several of these proposed relationships put TPB variables in a mediating role. A couple of other hypotheses pick up on the suggestion that personality may in part have its effects by directing attention and increasing or diminishing motivational states to suggest that personality may sometimes moderate the strength of relationships among TPB components. These specific hypotheses and their rationales are on the following pages. (Also note that to keep the study manageable, these hypotheses are a small subset of the possible mediator and moderator effects that could exist; other potential mediating and moderating relationships can be assessed in an exploratory fashion once the data have been collected.)

Openness reflects the degree to which an individual engages in positive thinking, creativity, and curiosity. These are characteristics which in an academic are likely to be positively related to engaging in behaviours involving knowledge acquisition and sharing, and thus be associated with a positive attitude towards the academic knowledge behaviours necessary for publishing and presenting.Studies also show that persons with higher levels of *Openness*

demonstrate higher team and individual performance and quality decision making (LePine, 2003; Neuman et al., 1999), which again should be related to positive attitudes towards activities involved in knowledge productivity. Thus the author predicts that:

H3a. Openness is positively related to Attitude towards publishing/presenting.

Individual with higher neuroticism traits shows likely to have ridiculous ideas, does not control their emotions and poor stress management (Rothmann & Coetzer, 2003). In addition, Mohammed and Angell (2003) note that team member with high neuroticsm will influence the team performance inefficiently Hence, in the current study it is expected that individuals with high Emotional Stability will have more positive attitudes towards engaging in the knowledge productivity behaviours necessary for publishing and presenting, due to strength ability to handle stress and lower impulse control. Therefore, the author hypothesizes that:

H3b. Emotional Stability is positively related to Attitude towards publishing/presenting.

As previously described, *extraverted* individuals have an outgoing nature (Giluk & Postlethwaite, 2015), engage in and enjoy more social activities, and tend to be positive and optimistic (Barrick et al., 1998; Barry & Stewart, 1997). Therefore, it is expected that individuals higher in extraversion will be more knowledgeable of subjective norms, and that this knowledge will more strongly influence their intentions about whether or not to engage in academic productivity behaviours. That is, when subjective norms in a particular setting or within a particular group of researchers are very supportive of successfully engaging in research, persons who are moderate to high in extraversion should be more likely than those who are low in extraversion to have intentions to also engage in academic productivity behaviours. When social norms do not support research (but perhaps emphasize other activities such as teaching and/or administration), then persons high in extraversion are more likely to be swayed away from intentions to engage in academic productivity behaviours. In other words, it is expected that extraversion will moderate the relationship of subjective norms to intentions. Thus the author hypothesized that:

H4a. The relationship of Subjective Norms with intentions to engage in academic productivity behaviours is positively moderated by Extraversion.

Similarly, individuals high in *Agreeableness* are generally eager to help others (Rothmann & Coetzer, 2003), and likely to go along with the agreed upon rules of social behaviour expressed in norms. In addition, agreeableness matters when interactions involve helping, cooperating,

and nurturing others (Barrick et al., 2001). Because academic research may depend upon collaboration, an academic who is high in agreeableness may experience strong subjective norms for effective teamwork and success. Supported by Klimoski and Mohammed (1994), stated that high agreeableness personality lead the most effective way to work together as a team. The author hypothesized that:

H4b. The relationship of Subjective Norms with intentions to engage in academic productivity behaviours is positively moderated by Agreeableness.

Barrick and Mount (1993) stated that conscientiousness is associated to an individual's self-control and active procedures in planning, organizing, and conducting the tasks. Significant cumulated correlations between conscientiousness and job performance were reported by the meta-analysis. orderly and dependable. In our case, individual that comprised of this aspect of personality are persistence, focus on and commitment to the task and cooperation (Barry & Stewart, 1997). This should lead to greater success in publishing, putting under this consideration, thus the author hypothesized that;

H5. Conscientiousness is positively related to Perceived Behavioural Control towards capabilities in publishing.

From the preceding discussion this study has formulated hypotheses which proposed the relationship of Big Five and Theory of Planned Behaviour (TPB) with Knowledge Productivity Behaviour.

H3:

H3a. Openness is positively related to Attitude towards publishing/presenting.

H3b.Emotional Stability is positively related to Attitude towards publishing/presenting.

H4a. The relationship of Subjective Norms with intentions to engage in academic productivity behaviours is positively moderated by Extraversion.

H4b. The relationship of Subjective Norms with intentions to engage in academic productivity behaviours is positively moderated by Agreeableness.

H5. Conscientiousness is positively related to Perceived Behavioural Control towards capabilities in publishing.

In sum, personality is a broad psychological mechanism which plays an important role in guiding behaviour. According to Phares (1991), feeling, thoughts, and behaviour are unique and different to each individual as these aspects are developed by a stable combination of personality traits. As mentioned earlier by Agnieszka, (2013), personality is defined here as a set of traits, that on the one hand are the foundation of consistency of behaviour. Yet personality variables do not provide a full picture of effects on behaviour. For example, a study by Conner and Abraham (2001) shows that integration of the Big Five with the TPB may provide a more sufficient model of health behaviour. Mark (2001) in his studies stated that, a sufficient amount of determinants of intentions and behaviours were supplied based on the combination of personality traits. Chatzisarantis & Hagger (2008), highlighted that TPB and personality traits can improvise the model's predictive validity. In light of this, the current proposed model includes hypothesized effects of both personality and TPB, as well as mediated and moderated links among them. The next sub section outlines the control variables which may contribute to influence Knowledge Productivity Behaviour.

2.6 Relevant Situational factors

In this thesis, the focus is on exploring personality traits and behaviour factors associated with knowledge productivity. Nevertheless, it must also be acknowledged that situational factors may contribute to influencing, in order to be able to more clearly demonstrate that the hypothesized effects are due to the focal Big Five and TPB variables, and not to other situational factors. In other words, in my model the effects of situational factors will be controlled to eliminate them as alternative explanations for results.

In this study, the trait-focused variables are crucial as they will provide better insights of an individual's perspective. In the environmental context, situational variables are present as they are the main elements to increase the performance of faculty members' research. Initially, due to the disappointment in predicting behaviour based on the personality variables (see Allport & Vernon, 1933; Dudycha, 1936; Hartshorne & May, 1928; Newcomb, 1929),, Mischel (1968), viewed that predicting behaviour should not only base on traits, but also by considering the situational factors too.

According to Kroenung and Eckhardt (2015), situational factors positively influence the attitude-behaviour relationship in the Information system fields, although various situational factors have been identified as significant moderators of adoption behavior (Venkatesh & Davis, 2000; Wu & Lederer 2009; Jasperson, Carter & Zmud, R. 2005). Furthermore, many

situational factors have been found to affect behaviour (Fischer et al., 2011), (Bridges & Clark, 2000), (Carlson & Miller, 1987; Carlson, Charlin, & Miller, 1988), (Schneider, Lesko, & Garrett, 1980) and (Matthews & Canon, 1975). In combination to all, these studies highlighted the effects of situational factors onto an individual's behaviour. (Lefevor, Fowers, Ahn, Lang, & Cohen, 2015).

In this study, the author incorporates attribution of tacit knowledge into the knowledge activities enables the researchers to investigate the individual's actions instead of determining what the individual knows. Additionally, the outcome of the knowledge productivity is based on the complexity of the human behaviour.

Therefore, both individual and situational dimensions are discussed. Hence the situational factors have been identified drawn by prevalent studies as situational level factors that might associated with research productivity among academic staff. Relevant factors been proposed include such things as: (a) Teaching load/ Administrative duties; (b) IT Infrastructure; (c) Funding/ grant. Academicians' position, years at organisation, gender, faculty size and other similar individual level variables may also be relevant and will be measured. Following is the discussion on the control variables;

Teaching load/ Administrative duties. Another source of factors that influence the time and energy for research activity is the teaching responsibilities. It was discovered that faculty with lesser courses preparation will have less time to prepare for teaching activities and tend to have more time to commit in doing research (Kaya & Weber, 2003). Based on the previous academic productivity, by reducing the amount of teaching loads (Levitan & Ray, 1992), the research productivity will increase with more time spent on research and publication activity (Cargile & Bublitz, 1986; Lou et al. 2007).

IT Infrastructure/ Resources. Empirical studies have asserted the importance of available resources that connected to the matter of research productivity (Creswell, 1985; McGhee & Ford, 1987).These sources can be the technological infrastructure and research-related resources (Govender, 2013; Lim, So, & Tan, 2010) collaborated with the researcher's effectiveness (Boulter, 2007). Bhagwatwar , Hara, and Ynalvez (2013), expounded that the use of technology by faculty members and students was conceptualized and labelled as a determinant in the research productivity. Supported by Lou et al. (2007), in their studies, indicated instructors encountered few barriers reported that the university's information software that was used to facilitate knowledge sharing was too old to be used.

Funding/ grant. According to Auranen and Nieminen (2010), in recent decades, university sector research funding has changed in many countries. In the meantime, public funding had undergone some transformation. The allocation of Government core fund had increased based on the performance while funding agencies implemented the mission-oriented and contract-based strategic allocation procedures (OECD, 1998, 2004; Skoie, 1996; Slaughter & Leslie, 1997). Yet, the most common source of funding for university research is the public funding to be more productive in producing scholarly publication. Funding is both more likely to be awarded to scholars who have been successful in knowledge production in the past, and is likely to increase their changes of engaging in further knowledge production in the future.

Postgraduate supervision. A hierarchical moderated regression analysis was conducted by Valle and Schultz's (2011) onto 440 management faculty members. Records have been discovered that doctoral students were supported with their top-tier publication. Meanwhile, Hu discovered that doctoral students have more research productivity while Kyvik and Smeby, (1994), found that there is a positive connection between the number of graduated students that had been supervised and the productivity of the research.

Academics' rank/ position. The increment of the academic position hierarchy is based on the publication rate whereby the professors are the most productive individuals while individuals at lower academic positions only able to publish several publications per year (Abramo, D'Angelo, & Di Costa, 2011; Aksnes, Rørstad, Piro, & Sivertsen, 2011; Allison & Stewart, 1974; Kyvik, 1991; Tien & Blackburn, 1996). This is because the junior staffs are less experience than the higher personnel. As time pass by and the knowledge is increasing, a scientist in a senior position is more likely to have greater chance to conduct a research and write articles.

Gender. Meanwhile, on the gender aspect, several studies discovered that the female scientists are more prone to publish lesser publication than the male colleagues (Abramo, D'Angelo, & Caprasecca, 2009; Xie & Shauman, 1998; Kyvik & Teigen, 1996; Long, 1992; Cole & Zuckerman, 1984;). This is due to their individual's choice (Ward & Grant, 1996). whereby the women choose to devote themselves to the teaching and administrative works whereas the male scientists tend to focus on publishing researches and supervising PhD students. Yet, a recent study highlighted that young female researchers tend to produce more publications than the male researchers among the Dutch social scientists (Arensbergen,

Weijden, & Besselaar, 2012).

Department/ Faculty Size. According to Johnson (1996) in his study evidence that there are association between department or faculty size and scholar publication in the United States and found a positive relationship as large number of faculties can more readily encourage collective research team, and may just turned out to be all the more dominant inside a school or universities and therefore get more encouraging research support resources for research activities for example, research grant and fund, research resources and support in such as research assistant, research travel, tool and equipment, and academic replacement substitutions for those on leave, all assets that may encourage more prominent research publication and productivity.

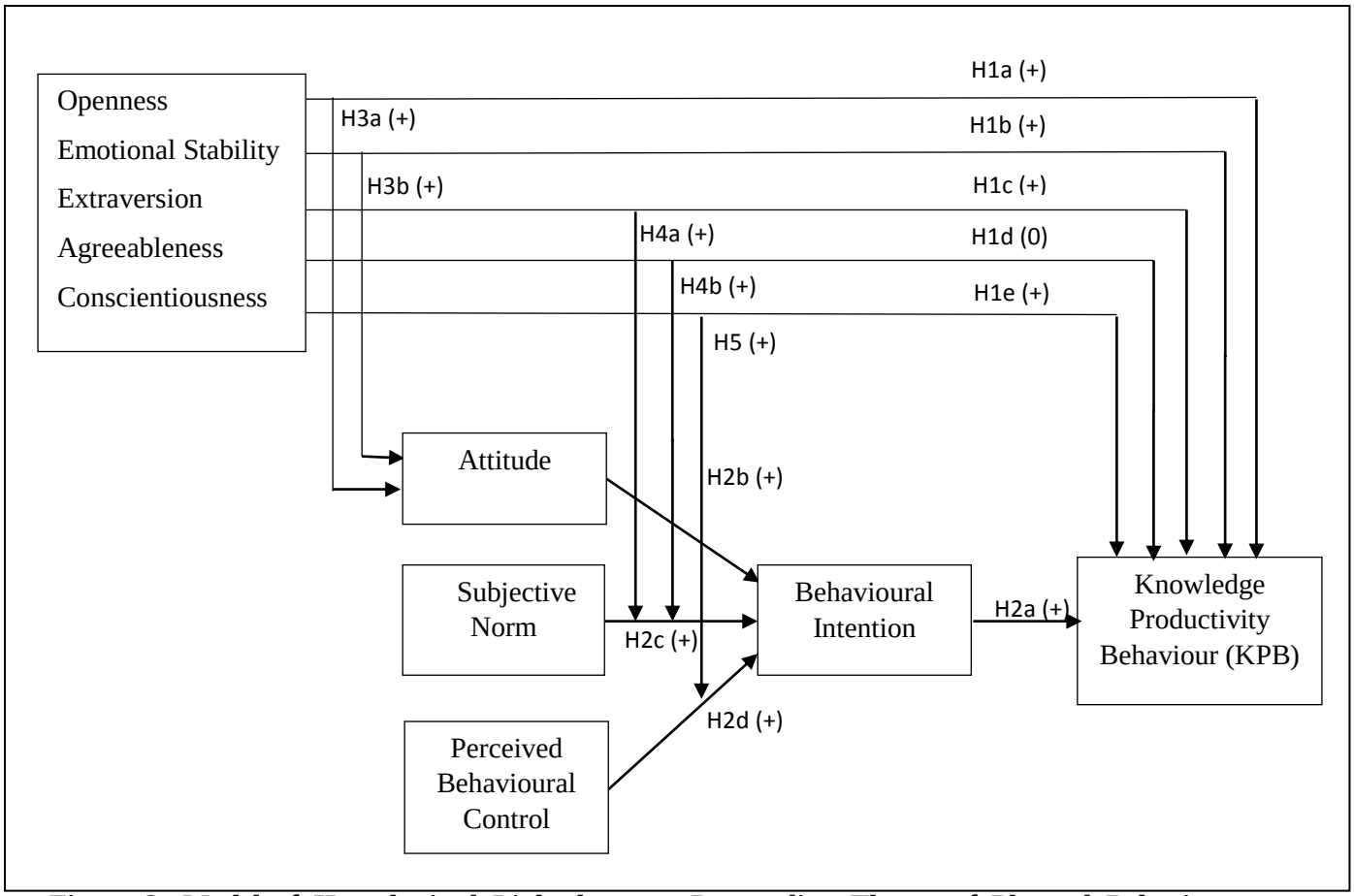


Figure 2: Model of Hypothesized Links between Personality, Theory of Planned Behavior components, and Knowledge Activities. (Note that in the data analysis phase, additional mediated and moderated paths were estimated in an exploratory fashion.)

A more comprehensive model depicting the full set of hypothesised relationships is shown above in Figure 2. The framework above represents the potential conceptual framework as well as ordering analytical strategies. The research objective was to examine the individual

factors influencing the Knowledge Productivity among academics. Hence the independent variables for the study consisted of the personality dimensions of Big Five model and the Theory of Planned Behaviour (TPB) component as mediating variables, and Knowledge Productivity as the dependent variable. Since Knowledge Productivity could be affected by personal aspects, this research suggests adapting and extending the Theory of Planned Behaviour by including the Big Five aspects. When testing the model, a first step will be to establish whether the Big Five dimensions directly affect Knowledge Productivity (i.e., without including any mediators). This is indicated in the figure by the lines labelled H1 a-e. A second step would be to found out whether TPB variables directly affect Knowledge Productivity, which is drawn in the model above by the lines labelled H2a-d. Next, is to establish whether the proposed mediating and moderating hypotheses involving Big Five dimensions and the TPB affect Knowledge Productivity. These are depicted with the lines labelled as H3-5. Finally, the model will be re-estimated to explore whether there are any remaining un-hypothesized relationships that are strongly suggested by the data.

2.7 Conclusion

This study investigated factors impacting the Knowledge Productivity of academicians. The study adopts and expand both Theory of Planned Behaviour and Big Five Model as a theoretical basis. An underlying presumption is that, individual personality and behaviour may influence knowledge activities among academics. The outcome from this research is predicted to improve understanding and support academicians as the information providers with the development of another new model for Knowledge Productivity Behaviour from Big Five Model (Big Five) and Theory of Planned Behaviour (TPB) perspective. Results from this study potentially may help faculty members to better understand how they might increase their success in research and generate higher publication outputs. Indirectly, understanding better how to increase individual Knowledge Productivity may elevate research funding in the higher education sector.

CHAPTER 3: QUANTITATIVE METHODOLOGY

3.0 Research Design & Procedure

The multiple data collections reported in this thesis were primarily quantitative in nature (i.e., questionnaires), but also involved the collection of some qualitative, interview data (will be discussed in next chapter). Based on the conceptual model presented in earlier chapters of this document, the relations amongst three key sets of variables were investigated, i.e., the Big Five (B5) personality dimensions of extraversion, agreeableness, conscientiousness, emotional stability, and openness, the Theory of Planned Behavior variables (TPB; intentions, attitude, subjective norms and perceived behavioural control), and the components of Knowledge Productivity Behavior (KPB; Knowledge Acquisition, Knowledge Sharing and Knowledge Transfer).

Four separate data collection efforts were made and reported in this document: (1) a small sample pilot study primarily intended to provide a trial of the questionnaire methodology (especially to determine whether the TPB and KPB measures specifically developed for this study were adequate); (2) the main study data collection via questionnaire, comprised of two subsamples whose results were analysed separately and (3) a follow-up data collection of the behavioural criterion variables (i.e., KPB components) collected approximately a year after the main study data collection, to be used to determine whether the B5 and TPB variables were valid predictors of future behaviours. The remaining part of this chapter provides a detailed description of the research designs and specific methods used for each of the quantitative data collection efforts.

3.1 Ethical procedure

For all of the research reported in this document, the appropriate ethical approval was received, following the Durham University Business School procedures (see copies of relevant documents in Appendix 1). The key ethical issue for this study involved confidentiality. The author feels that maintaining confidentiality helps establish trust with the research participants while maintaining the participant's dignity. In practice, confidentiality involves protecting an individual's privacy (Arlene Fink, 2016) by informing them of how the information they disclose will be used, and how it will not be revealed to others without permission. In this study, respondents were colleagues and professional peers of the

researcher, as they came from the same academic institution. Both questionnaire and interview respondents were told in a written informed consent statement that when study results are made public, their personal information would be kept confidential, i.e., by making data anonymous by removing the contributor's name and not reporting any other details that might uniquely identify individuals. To avoid keeping a data file that includes individual names, yet still be able to match respondents providing the main study data with those providing the one-year follow-up data, a procedure was used that generated a unique code for each respondent, yet did not rely on their names.

3.2 Research Samples and Data Collection Procedure

The target research population (i.e., the entire group of people, events or things of interest that the researcher wishes to investigate, Sekaran, 2003) for this study was academics in higher education institutions who were expected to do research as well as to teach, and thus had key potential roles in knowledge productivity. The specific samples and data collection procedures for each of the four data collection efforts are described in the sections that follow.

3.2.1 Pilot Study Sample and Data Collection Procedure

In the pilot study, a total of thirty (30) volunteer respondents (academics) from various Malaysian Higher education institutions were involved. Personal connections of the researcher were used to identify academics from Malaysia Higher education institutions (HEIs) as potential respondents. Potential respondents were given a link to the online survey that is administered by SmartSurvey through email. The online survey link was sent via individual email. The researcher reminded the respondents that their participation was voluntary, anonymous and thus confidentiality was assured by keeping their responses private and utilising them for the study and research purposes only.

Note that one important purpose of the pilot study was to collect data that could be used to assess, and if necessary, to improve the internal consistency reliability and validity of the questionnaire. Thus, a goal of the pilot was to identify and discard all unnecessary, difficult or ambiguous questions and to revise any questions that are not answered as expected (Peat et al. 2002).

3.2.2 Main Study Samples and Data Collection Procedure

For the main study, a working academic sample from Malaysia Public University was solicited. Potential respondents were individually emailed a link to an online survey administered by SmartSurvey. (Access to the relevant list of email addresses was made available as the researcher is a member of the university academic staff.) In addition, the researcher emailed each of the Coordinators of Corporate Communications for the branch campuses (exclude Sabah and Sarawak) to ask for permission in case it was needed to collect any data in person.

At the start of the survey, the researcher reminded the respondents that their participation was voluntary, responses were anonymous and thus confidentiality was assured by keeping their responses private and utilising them for the study and research purposes only. Respondents were also reminded to answer the survey only once. The online survey was open for responses from 10 November 2016 until 28 February 2017. A total of six (6) attempts were made in distributing the online survey. For the first phase, the first distribution attempt was made in November (10/11/2016) to all thirteen (13) campuses in Malaysia. In that first week after distribution, the researcher received seventy eight (78) responses, and the by hundred and seventy (170) totals two weeks after. In a second phase, the survey was resent twice in December (on 6/12/2016 and two weeks after that on 19/12/2016). This attempt plus the earlier efforts yielded a total of four hundred and four (404) responses.

Due to insufficient total responses, during this month, the researcher made an effort by traveling to university branch campus in Puncak Perdana, Selangor in order to increase the response rate by meeting with the Dean of the Information Management School, Assoc. Prof. Dr Mohd Sazili, describing details on the questionnaire and research progress and meeting with colleagues for support.

In the third phase, subsequently after meeting with the Dean, the researcher went to university branch campus Kedah in January 2017, to meet up with the top management, Rector, Dr. Asmadi Mohammed Ghazali for support and give explanation about the questionnaire and research progress and meeting with the colleagues in Kedah for support in answering the online survey. Throughout this month, fourth attempt in distributing the questionnaire was made on (3/1/2017) and two weeks after on (17/1/2017) with total of excellent respond rate of eight hundred and fourteen (814). Lastly, the researcher sent the final online survey in February on (20/02/2017), in this final stage the researcher note a

gentle reminder about the final closing online survey date and inviting them to participate before the survey ended. The researcher also expresses her thanks and huge appreciation to all respondents for their cooperation, support and contribution towards this research.

A total of one thousand and eleven (1011) volunteer respondents completed the questionnaire. However, this sample size was reduced in the data cleaning process, resulting in useable data from a total 985 respondents. These were divided between the two faculties of Social Science (N = 749), and Science and Technology (N = 236). Table 3.2.1 lists more specifics on these two faculties.

Table 3.2.1 Sample

	Potential Respondents		Main study Sample	
Faculties	**F**	**%**	**F**	**%**
Social Sciences & Humanities				
1. Accountancy	122	7	91	12
2. Business & Management	490	28	264	35
3. Hotel & Tourism Management	82	5	46	6
4. Information Management	91	5	75	10
5. Administrative Science & Policy Studies	88	5	46	6
6. Law	91	5	31	4
7. Art & Design	183	11	33	4
8. Language Studies	233	14	91	12
9. Communication & Media Studies	76	4	19	3
10. Academy of Contemporary Islamic Studies	94	5	27	4
11. Music	37	2	3	0
12. Education	98	6	28	4
13. Film, Theatre & Animation	38	2	4	1
Total	1723	100	758	100
Science and Technology				
1. Electrical Engineering	187	11	35	15
2. Mechanical Engineering	93	5	5	2
3. Chemical Engineering	88	5	6	3
4. Civil Engineering	74	4	13	6
5. Pharmacy	71	4	8	3
6. Medicine	183	10	21	9
7. Dentistry	69	4	11	5
8. Health Sciences	125	7	14	6
9. Applied Sciences	245	14	28	12
10. Computer & Mathematical Sciences	248	14	42	18
11. Architecture, Planning & Surveying	273	16	39	17
12. Sports Science & Recreation	29	2	7	3
13. Plantation & Agrotechnology	62	4	7	3
Total	1747	100	236	100

Others			
Centre of Foundation Studies		2	12
Not listed		15	88
Total		17	100
TOTAL	3470	1011	

Note. All potential respondents come from University Main campus excluding branch campuses, figures obtainable based on year 2016-2017, changes might be occurred.

3.2.3 One-year Follow-up Study Sample and Data Collection Procedure

To further complement the study, it was considered that a second round of questionnaires should be distributed. Follow-up studies are generally done to increase the overall effectiveness of the research effort. The primary reason for collecting the Time 2 data in the current study is to investigate the effects of individual influences on knowledge productivity using a criterion variable that has been collected at a separate, later time than the proposed independent variables (i.e., personality) and mediating variables (i.e., behavioural components of the Theory of Planned Behaviour). Having the outcome variables collected at a later point in time allows for stronger causal conclusions. First, inflation of the estimated path coefficients due to common method bias is reduced when the dependent variable is collected at a substantially later point in time. In addition, the psychological processes measured by the mediating variables (i.e., attitudes, subjective norms, perceived behavioural control, and intentions) at Time 1 operate over time, so the measures of outcome variables collected at Time 2 could be argued to be more conceptually relevant than the measures of those variables at Time 1. The results of data analyses of Time 2 study are discussed further in Chapter 5.

Thus, in the Time 2 data collection, attention was particularly focused on collecting a second measure of the Academic knowledge productivity outcome. Due to the researcher's time limitation, the follow-up of this study was limited to a particular point in time to allow greater opportunity to have further investigation in the next stage. The approach taken was identical to the main study, relying on an online survey methodology with a working academic sample from Malaysia Public University. The online survey was open for responses from 9 October 2017 until 7 December 2017. As a result, to date, the researcher received six hundred and fifteen (738) responses. The details are discussed next.

A total of six (6) attempts will be made in distributing the online survey. For the first phase, the first distribution attempt was made in October (09/10/2017) to all thirteen (13) university branch campuses in Malaysia. In the first week after distribution, the researcher received seventy five (75) responses, and subsequently by another two time resent the survey on (23/10/2017 and 30/10/2017) resulting four hundred and four (404) responses in totals.

In the following weeks, the survey was resent three times in November. Throughout this month, third attempt in distributing the questionnaire was made on (13/11/2017) and each weeks after on (20/11/2017 and 27/11/2017) with total of excellent respond rate of nine hundred and sixty two (962).

Lastly, the final online survey was close in December on (07/12/2017) resulting nine hundred and eighty (980) responses in totals, in this final stage the researcher will note a gentle reminder about the final closing online survey date and inviting them to participate before the survey ended. A note of gratitude will be send to all respondents to express researcher appreciation to all respondents for their assistance and contribution in this important endeavour.

3.3 Quantitative Instruments and Measurements

This section describes the questionnaires that were developed for the three quantitative data collection efforts. Because there were fairly minimal changes to the questionnaire from the pilot study to the main study, and from the KPB variables in the pilot and main studies to the one-year follow-up study, substantial space will be devoted to describing the pilot study questionnaire. Descriptions of the instruments for the main and follow-up studies will simply note any changes that were made to the original pilot study questionnaire, and thus are substantially shorter.

3.3.1 Pilot Study Questionnaire

The three main sets of variables in the proposed model of KPB are the Big 5 personality dimensions, the TPB variables, and the knowledge productivity behaviours (KPB). Established measures of the personality variables were available, as described in more detail shortly. However, the researcher needed to develop TPB and KPB variable measures that were specific to the research project. These were based on theory and modelled after existing measures when possible, as described in following sections. In addition, the literature

suggested a set of relevant covariate/control variables that were believed to be important to interpreting the results. A full copy of the measure is included in Appendix 2.

3.3.1.1 Pilot Study: Measures of the Big Five Personality Variables (B5)

The Big Five dimensions of Openness, Conscientiousness, Extraversion, Agreeableness, and Emotional Stability were measured using the 50-item International Personality Item Pool-Big Five instrument (IPIP-Big Five; Goldberg, 1999). The IPIP is a public domain measurement resource comprised of a large pool of items developed for use in personality tests. It can be accessed at the following internet site: *http://ipip.ori.org/new_ipip-50-item-scale.htm.* Empirical studies have identified validated ways to combine and score items in the pool to create measures of openness, conscientiousness, extraversion, agreeableness and neuroticism that are comparable to other established personality instruments that are copyrighted, and thus not in the public domain.

IPIP was established with a personality item-writing project that had been organized by Wim K. B. Hofstee and his colleague along with the students from the University of Groningen in the Netherlands. As a result, the aim of IPIP research has moved to the Oregon Research Institure in the United States whereby the IPIP items were altered with additional sets by Lewis R. Goldberg to be included in the survey. As stated in the website, to date IPIP comprise over 3000 items, with translations into 40 different languages.

The 50 items used in the current study to measure the Big 5 are listed in the copy of the questionnaire in Appendix 2. The English language version of the items was used in the survey, as the academic respondents were expected to be quite familiar with the language. Each dimension is described by 10 items, and the items have a mix of positive and negative wordings. For example, one positive item asked "*Have a rich vocabulary"* and one negative item asked " *Does not have a good imagination* The responses of the items were derived from the 5-point Likert scales, with response anchors ranging from 'not accurate' to 'very accurate.' This measure has been found to be valid and reliable as measures based on multiple research studies (Aghababaei & Arji, 2014; Briley & Tucker-Drob, 2014; Clark, Lelchook & Taylor, 2010; Dahlen & White, 2006; Darviri & Woods, 2006; DeYoung, Weisberg & Peterson, 2013; Donnellan, et al., 2006; Erdle & Aghababaei, 2012).

3.3.1.2 Pilot Study: Measures of the Theory of Planned Behavior (TPB) Variables

The Theory of Planned Behavior (TPB) predicts an individual's intention to engage in a particular behaviour at a specific time and place. It posits that individual behaviour is driven by behavioural intentions, where behavioural intentions are a function of three determinants: an individual's attitude toward the behaviour, subjective norms, and perceived behavioural control (Ajzen, 1991). Because item content for these variables will change depending upon the specific behaviours being studied, researchers typically construct their own items following guidelines in the literature.

Icek Ajzen (2006) notes that when designing TPB measures, researchers should: (1) clearly define the behaviour of interest in terms of its target, action, context, and time elements; (2) specify the research population of interest to the investigation; and then (3) formulate five to six items intended to assess each of the theory's four major constructs, keeping the behaviour of interest and the research population in mind. This procedure was followed to develop the TPB measures for the current study, items were generated by the researcher and discussed and edited in consultation with the dissertation supervisors.

The pilot study version of the newly created TPB measure was comprised of the following: Attitude (8 items), perceived norms (9 items), perceived behavioral control (PBC: 7 items), and intentions (8 items). More items were generated than were expected to be used in the main study questionnaire, part of the purpose of the pilot study was to determine which of the TPB items worked best, and approximately how many were really needed to adequately measure each construct.

Instructions for the TPB measure asked participants to indicate the number that best describes their personal opinion for each item, using a 7-point Likert-style response format, with response anchors varying depending upon item content. For example, one attitudinal item asked "*The effect on my career of attending professional conference, is"* and the 7-point response scale had anchors of *"unbeneficial: _1_2_3_4_5_6_7_: beneficial".* In another example, one norm item asked *"I am expected by my colleagues to keep up with new trends in my research areas"* and the 7-point response had anchors of *"disagree: _1_2_3_4_5_6_7_: agree".* Note that the items were formulated to be compatible with the intended knowledge productivity behaviour criteria, i.e., attitudes, norms, PBC, and intentions were always assessed for the specific behaviours of attending conferences, presenting and publishing papers. The full set of these items is in Appendix 2.

3.3.1.3 Pilot Study: Measures of the Knowledge Productivity Behaviour (KPB) Variables.

Based on previous literature (Harrison and Kessels (2004), Jansink (2005), (Keursten, Kessels, & Kwakman, 2003)., (Bai & Hudson, 2010) and etc), the current study defines academic knowledge productivity as the capability with which individuals create and produce knowledge, knowledge-based improvements, exploitation, and innovations. The current study focused on the theoretically based knowledge activities of knowledge acquisition, knowledge sharing and knowledge transfer in the academic context. It was important to develop measures of these activities that were tailored specifically to the purposes of the research, that is, considering the nature of the respondents and the typical types of knowledge activities that occur as academics go about their research activities. In addition, it was important to choose and word the descriptions of the activities so that they would be relevant to researchers across a variety of academic disciplines.

After the researcher had reviewed the theory and referring to similar conceptual measures in the existed researches, the questionnaire items were created. Theory suggests that the *knowledge acquisition* measure should tap the extent that academicians actively bring new ideas from the outside into their institutions, and their capability at turning existing knowledge into new knowledge, involving activities that include searching for, identifying, and absorbing potentially valuable knowledge from external sources. *Knowledge sharing* occurs when people are free and open to share knowledge with others in order to facilitate an innovative environment, thus a relevant measure should tap the extent to which an individual academician is sharing his/her expert knowledge, experience and skills. The *knowledge transfer* measure should reflect the extent of transferring knowledge from one individual to another by means including mentoring, teaching/training, production of presentations and written documents, and other collaborations such as consultancies and joint research projects. These definitions, plus illustrative examples in works by Bok and Kim (2002; Huang (2014), Dahari, et al. (2014) and Hsu, et al. (2001) served as a basis for developing the KPB measure.

This procedure resulted in the following sets of items: knowledge acquisition (4 items), knowledge sharing (8 items) and knowledge transfer (8 items). An example of an item developed to measure knowledge acquisition is, "*I read professional journals and similar sources to acquaint myself with new ideas that might be relevant to my research interests*".

An example of an item developed to measure knowledge sharing is, "*I informed my colleagues about new ideas, methods and research skills*". An example of an item developed to measure knowledge transfer is, "*I submitted a paper to an academic conference*". The full set of items is listed in Appendix 2.

In the questionnaire, using the 5-point Likert-style responses, the responses to the items were established. In terms of frequency, the 5-point Likert-style responses indicate the involvement of specific knowledge productivity behaviour. The response anchors ranged from '1 =not at all; 2= 1-2 times this year; 3= 1-2 times per semester; 4= 1-2 times most months and 5=-2 times most weeks.' Respondents were asked to circle the number that best describes their personal opinions.

3.3.1.4 Pilot Study: Additional Measures.

In addition to the focal variables of the model, measures of the following participant characteristics were also included in the questionnaire: age, gender, working experience, highest qualification, faculty position, position status, teaching, student supervision and school. Additionally, respondents were also directly asked for feedback to identify ambiguous and difficult questions, and to record the time taken to complete the questionnaire (used to help to decide whether the questionnaire was reasonable in length.

3.3.2 Main Study Questionnaire

Across all items and instructions, a few terms were changed from the pilot study to the main study, such as rewording all instances of "*academicians*" into "*academics*". However, the three main sets of variables in the proposed model of KPB -- i.e., the Big Five personality dimensions, the Theory of Planned Behaviour variables, and the knowledge productivity behaviours – were measured very similarly to the pilot study. For example, no changes at all were made in the Big Five measurement. Thus, in this section it is only noted where there are changes in measures from the pilot to the main study. A full copy of the survey is included in Appendix 3.

Theory of Planned Behaviour (TPB) variables. The Theory of Planned Behavior items were initially tested in the pilot study and showed good measurement properties in that study. Minor adjustments were made, based upon the pilot study results. Specifically, two TPB

items were removed from the main study questionnaire: one Attitude item ('The idea of sharing my research knowledge with other collegues, is…') and one Intention item ('Over the next year, I will make an effort to publish a peer reviewed paper…'). This resulted in the following set of TPB items that were retained in the questionnaire: Attitude (7 items), perceived norms (9 items), perceived behavioral control (PBC: 7 items), and intentions (7 items). Responses were still made using a 7-point Likert-style response format, with response anchors varying depending upon item content for example *"unbeneficial: _1_2_3_4_5_6_7_: beneficial", "unlikely: _1_2_3_4_5_6_7_: likely", "disagree: _1_2_3_4_5_6_7_: agree'*, and etc.

Knowledge Productivity Behaviour (KPB) variables. One Knowledge Transfer item was dropped ('I worked on a report of research findings that is intended for submission to academic/ professional journals.'), and the Knowledge Productivity response anchor of "*1-2 times this year*" was changed into "*1-2 times this past 12 months*".

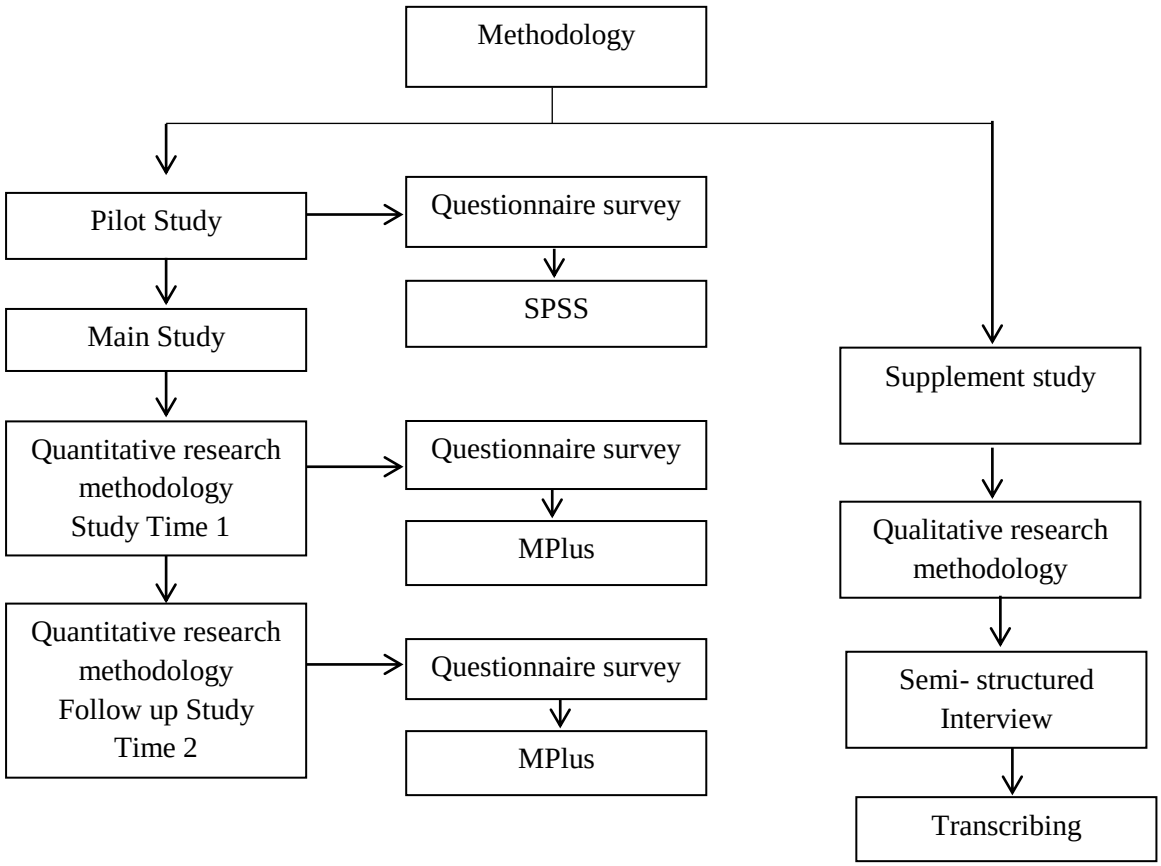
3.3.3 Follow-up Study Questionnaire

For this follow-up study, the items asked in the survey were much shorter compared with the past survey. Only Knowledge Productivity Behaviours items and six open-ended questions probing for additional details on presentations and publications were included. The Knowledge Productivity Behaviours were measured very similarly to the main study and no changes at all were made in the KPB measurement. Only a few changes in measures were made from the main to the follow-up study such as rewording all instances of "*over the past academic year*" into "*over the past 12 months*". For example "*Over the past academic year, I joined or maintained a membership in a professional organization to keep current with new research directions" to "Over the past 12 months, I joined or maintained a membership in a professional organization to keep current with new research directions."* A full copy of the survey is included in Appendix 4.

3.4 Analytical framework and approach

The main methodological approach taken in this study is quantitative, and is used for both the Time 1 and Time 2 study. Collection of some qualitative data is also involved to supplement the quantitative data (i.e., as discussed in chapter 6). Electronic mail was used as a survey method to collect the data quantitatively and the approach of individual interview was appropriate to attain qualitative findings. (see the figure 3.4.1 below)

Figure 3.4 .1 Analytical framework and approach



During the initial stage of this study, the descriptive analysis of the pilot, main study and one-year-follow-up data was done using the SPSS version 20. This included analyses describing the demographic profile of respondents (e.g., percentage and frequency). In order to test the scales internal consistency, reliability test was performed. Moreover, this study also used inferential statistical analysis (i.e., correlation and regression techniques) to test the research hypotheses. Because the pilot study sample size was quite small, and thus statistical power was low, a liberal probability level of $p < .10$ was used in assessing the statistical significance of the correlation coefficients. A more typical $p < .05$ was used for the main and follow-up studies.

In particular, in the main study (Time 1) and one-year follow-up data (Time 2), the path coefficients associated with specific hypotheses were estimated and indirect effects also were estimated for the hypotheses which propose that TPB mediates personality effects on KPB, in order to determine whether the mediated effects are statistically significant. These were determined using path analysis conducted with an the SEM package MPlus. In the last stage of data analysis, overall multi-group analyses were performed in order to compare estimates

from the two Time 1 samples (i.e., the Social Science and Science Technology samples). Again, the SEM package MPlus was used to perform the multi-group analysis.

According to Ezzy, (2002) qualitative data analysis is an interpretative process. The process is not linear or clear, the qualitative data processes encompass progression and continuous procedure instead of a phase of the research process or a one-time occasion (Erlandson et al., 1993; Ezzy, 2002). In this study, qualitative data analysis resulting from the researcher's fieldwork supplemented the write-up of the thesis. During this stage of analysisthe transcript s were reviewed by the researcher according to the categories. Later, the transcripts were revised according to their categories and relationships, and revisited to ensure that stable sets of categories and relationships can be attained (see chapter 6).

CHAPTER 4: TIME 1 QUANTITATIVE ANALYSIS

4.0 Introduction

The analyses of the data that had been gathered from the respondents are reported in this chapter. This chapter begins with the pilot study results and followed by the main study which consists of Social Science and Science and Technology sample.

4.1 Pilot Study Sample

A major purpose of the pilot study was to assess the measurement instruments. Data analysis was also performed to provide a very preliminary hypotheses testing. However, because of the small sample size and correspondingly low statistical power as previously noted, little emphasis is placed on the outcomes of these results.

4.2 Pilot Study Sample: Participant Descriptive Statistics and Work Characteristics

Following data cleaning and screening, descriptive analyses of participant demographic characteristics were performed. Table 4.2.1 provides an overview of these results.

Table 4.2.1 Pilot Study Sample: Demographic and Work Characteristics

Description	Frequency (n)	Percentage (%)
Gender		
Female	20	66.7
Male	10	33.3
Age (in years)		
25-29	4	13.3
30-34	17	56.7
35-39	6	20.0
40-44	3	10.0
Highest Qualification		
Bachelor's degree	1	3.3
Master's degree	19	63.3
Doctoral degree	10	33.3
Years of Services		
11 months	1	3.3
1-4 years	13	43.3
5-9 years	5	16.7
10-14 years	8	26.7
15-16 years	2	6.7
Missing	1	3.3

Faculty Position		
Academic: non-admin	14	46.7
Academic: admin	16	53.3
Position Level		
Tutor	3	10.0
Part-time Lecturer	2	6.7
Contract Lecturer	1	3.3
Lecturer	14	46.7
Senior Lecturer	8	26.7
Associate Professor	1	3.3
Professor	1	3.3
Teaching		
Undergraduate	18	60.0
Undergraduate & postgraduate	12	40.0
Student Supervision		
None	16	53.3
Yes undergraduate	6	20.0
Both undergraduate & postgraduate	8	26.7
School		
Social Science	18	60.0
Science & Technology	12	40.0

Based on Table 4.2.1, the majority of respondents (66.7%) were female. The distribution of respondents by age indicated that nearly 90% of the participants were aged between 30 and 39 years. In terms of higher academic qualification, for 33.3% their highest academic degree was a Doctoral degree, the majority of them (63.3%) had their highest degree being a Master's degree and 3.3% had a highest degree of a Bachelor's degree. Meanwhile in terms of years of service, the largest group of participants (43.3%) have 1- 4 years of service, followed by 26.7% who have between 10-14 years of service, 16.7% between 5-9 years of services, 6.7% have 16-16 years of services and 3.3% who have 11 months of working services (0.1% did not respond to this item).

Looking at their faculty positions, 53.3% reported having some involvement with administrative duties and 46.7% indicated that they did not. Furthermore, among the respondents, 46.7% held the position of lecturer, 26.7% senior lecturer, 10% tutor, 6.7% part-time lecturer and 3.3% each for the positions of professor, associate professor and tutor. Next 60% of the respondents reported teaching undergraduate students only, and the rest were involved in teaching both undergraduate and postgraduate students. With respect to the supervision of theses and dissertations, 26.7% of the respondents supervised both undergraduates and postgraduates, 20% undergraduate theses/dissertations only, and 53.3%

were not involved in supervision. In addition, 60% of the respondents are from Social Sciences and 40% from Sciences & Technology.

4.3 Pilot Study Sample: Assessment of Reliability for Focal Variables

Cronbach's alpha was used to examine the internal reliability level of the sub-scales associated with the three focal constructs. According to Malhotra (2004), reliabilities are considered to be weak when the alpha coefficient is below .60. For alpha coefficient scores in the range of .60 to .80, they are considered to be moderately strong. In addition, alpha coefficients are considered to be very strong when they are in the range of .10 to 1.00. For this research study, the findings of the reliability analyses are shown below, grouped together by the three main sets of variables in the model.

As shown by the values reported in Table 4.3.1, all five personality scales in the study are adequately reliable since all values of alpha were more than .68. Indeed, most of the values fall in the range suggesting good reliability. In addition, when values of 'alpha if item deleted' were inspected, no items emerged as problematic. This result is as expected, given that the instrument used to measure personality was well-established, however, it was important to determine whether reliability was likely to be adequate for a sample with these specific characteristics (i.e., Malaysian academics) Therefore, the relationships among the items are reliable for further analysis.

Table 4.3.1 Pilot Study Sample: Reliabilities for Personality Variables

Personality Traits	Items	Cronbach's Alpha
Extraversion	10	.79
Conscientiousness	10	.68
Openness	10	.73
Agreeableness	10	.69
Emotional stability	10	.82

Note. $N = 30$

Table 4.3.2 shows the results of reliability analyses for the TPB variables. All of these variables indicate very strong reliability as all alpha coefficients are .87 or higher. Therefore, it can be concluded that measurement for the TPB variables used is very acceptable and the relationships among the items are reliable for further analysis. This was an especially important finding, as in contrast to the instrument used to measure personality, the TPB items were developed by the study researcher to be specific to the KPB context.

Table 4.3.2 Pilot Study Sample: Reliabilities for Theory of Planned Behaviour Variables

Note. N = 30

Theory of Planned Behavioural Variables	Items	Cronbach's Alpha
Attitude	8	.92
Norm	9	.87
Perceived Behavioural Control	7	.90
Intention	8	.96

Table 4.3.3 indicates that all Knowledge Productivity variables in the study are adequately reliable since the lowest alpha was .75. In addition, all twenty (20) items used to measure the three constructs are stable and consistent, as the values of 'alpha if item deleted' did not indicate any problems.

Table 4.3.3Pilot Study Sample: Reliabilities for Knowledge Productivity Behaviour Variables

Knowledge Productivity Variables	Items	Cronbach's Alpha
Knowledge Acquisition	4	.75
Knowledge Sharing	8	.95
Knowledge Transfer	8	.94

Note. N = 30

In sum, the set of reliability analyses indicated that all twelve (12) constructs are stable and consistent. Therefore, scale scores created from the intended set of items are reliable for further analysis.

4.4 Descriptive Statistics for Pilot Study Sample Focal Variables

Descriptive Statistics transform raw data in a manner that makes their distribution in the sample easy to understand and interpret (Kassim 2001; Sekaran 2000; Zikmund 2000). These statistics include univariate statistics such as the mean, standard deviation, and indicators of the distribution's skewness and kurtosis. Bivariate statistics such as the Pearson's correlation

coefficient can be used descriptively to determine whether the distributions of two different variables are related, its values indicate the direction and strength of the relationship. This next section describes the univariate distributions of the pilot study focal variables, as well as describing the bivariate relationships within each of the three different sets of variables (i.e., personality, Theory of Planned Behaviour, and Knowledge Productivity variables).

Table 4.4.1 Pilot Study Sample: Descriptive Statistics for Personality Variables

	Min	Max	Mean	SD	Skewness	Kurtosis
Extraversion	2.00	4.30	3.24	0.60	-0.21	-0.52
Agreeableness	2.80	4.90	3.62	0.49	0.73	0.69
Conscientiousness	2.00	4.50	3.61	0.47	-1.30	3.80
Emotional stability	1.90	4.50	3.02	0.64	0.26	-0.02
Openness	2.70	4.60	3.41	0.45	0.70	0.34

Note. N = 30. The response scale ranges from 1 to 5. Standard error for skewness = 0.43; standard error for kurtosis = 0.83.

Table 4.4.1 shows the overall mean for Extraversion is 3.24, Agreeableness is 3.62, Conscientiousness is 3.61, Emotional Stability is 3.02, and Openness is 3.41. This information indicates that most of the respondents tended to respond above the mid-point of the 5-point response scale to the statements assessing levels of extraversion, agreeableness, conscientiousness, and openness. The mean value for emotional stability tended to be a bit lower. Variabilty in responding was present in the sample, but was not especially high, as indicated by the relatively small values of all of the standard deviations. The largest standard division is for Emotional Stability (SD = 0.64) while the lowest is for Openness (SD = 0.45). Overall, there were no extreme values of skew in the set of personality variables. The variable with the greatest skew is Conscientiousness (*skew* = -1.30). The kurtosis values for these variables are within the normal distribution range (-2 to 2), except for Conscientiousness, which has a value of 3.80. In general, these distributional statistics suggest that there are few issues with the non-normality, with the possible exception of the Conscientiousness variable.

In addition to the univariate statistics, all possible correlations among the set of five personality variables were estimated. These are summarised in Table 4.4.2. All relationships between pairs of personality variables were positive. Agreeableness, Conscientiousness, Emotional Stability, and Openness all significantly related with each other, with values of the

correlations ranging from .39 to .64. In contrast, Extraversion showed no significant relationships with the other variables.

This result is interesting, as according to theory, the Big Five traits are orthogonal (i.e., unrelated) to each other. In practice, however, their measures often do correlate significantly. One potential implication of this is that if similarly high relationships among the personality variables are observed in the main study, it may make it difficult to completely separate estimates of the effects of one variable from another. However, it is anticipated that with a larger sample, the correlations may drop in value.

Table 4.4.2 Pilot Study Sample: Correlations among Personality Variables

	1	2	3	4	5
1. Extraversion	---	.30	.06	.35+	.27
2. Agreeableness		---	.49**	.39*	.64**
3. Conscientiousness			---	.41*	.48**
4. Emotional stability				---	.41*
5. Openness					---

Note. $N = 30$. + $p < .10$; * $p < .05$; ** $p < .01$

Table 4.4.3 shows the descriptive analysis for the Theory of Planned Behaviour variables. Based on the table, the overall mean for Attention is 5.93, Norm is 5.63, Perceived Behavioral Control is 4.91, and Intention is 5.68. This indicates that most of the respondents tended select value above the mid-point of the 7-point response. The highest standard division is Intention which is 1.17 while the lowest is Attention which is 0.92. The standard deviation (SD) for this variable (Attention and Norm) was very small (<1.0), this showed that the respondents were very consistent in their opinions when answering the questions, whereas not the case for Perceived Behavioural Control and Intention shows inconsistency in answering. Based on the table, the highest skewness value is Intention, which has a value of -1.41. The kurtosis value for this variable is within the normal distribution range (-2 to 2) except Perceived Behavioural Control and Intention, which has a value more than 3.58.

Table 4.4.3 Pilot Study Sample: Descriptive Statistics for Theory of Planned Behaviour

	Min	Max	Mean	SD	Skewness	Kurtosis
Attention	4.00	7.00	5.93	.92	-.51	-.86
Norm	3.11	7.00	5.63	.96	-.57	.43
PBC	1.00	7.00	4.91	1.13	-1.11	4.05
Intention	1.62	7.00	5.68	1.17	-1.41	3.58

Note. $N = 30$. Standard error for skewness = 0.43; standard error for kurtosis = 0.83.

Table 4.4.4 below indicates the correlations for Theory of Planned Behaviour Variables. Based on the table it shows that all four of the TPB variables, i.e., Attitude, Norm Perceived Behavioural Control and Intention, have a strong, positive, and statistically significant relationship with each other, with pearson correlations ranging from .46 to .75. The result shows that there are positive relationships between all Theory of Planned Behaviour variables. Again, these strong correlations may be partially an artefact of the small sample size of the pilot study.

Table 4.4.4 Pilot Study Sample: Correlations for Theory of Planned Behaviour

	1	2	3	4
1. Attitude	---	.59**	.46*	.74**
2. Norm		---	.70**	.71**
3. PBC			---	.75**
4. Intention				---

Note. $N = 30$. * $p < .05$; ** $p < .01$

Table 4.4.5 shows the overall mean for Knowledge Productivity Behaviour variables which indicates, KA (Knowledge Acquisition) is 2.70, KS (Knowledge Sharing) is 2.86, and KT(Knowledge Transfer) is 2.07. This described that most of the respondents tend to respond above the mid-point of the 5-point response scale for KA and KT while below mid-point of the 5-point response scale for KT. The highest standard division is independent variable for Knowledge Sharing which is .98 while the lowest is Knowledge Acquisition which is 0.76. The standard deviation (SD) for these variable was very small (<1.0), this showed that the respondents were very consistent in their opinions when answering the questions. Based on the table, all of the variables skewness value is symmetrical, which has a value of more than .10. The kurtosis values are in the range of -2 to 2, therefore, this variable is in the normal range of distribution.

Table 4.4.5 Pilot Study Sample: Descriptive Statistics for Knowledge Productivity Behaviour

	Min	Max	Mean	SD	Skewness	Kurtosis
KA	1.00	4.25	2.70	.76	.10	-.22
KS	1.00	4.88	2.86	.98	.10	-.85
KT	1.00	4.00	2.07	.79	.51	-.44

Note. $N = 30$. Standard error for skewness = 0.43; standard error for kurtosis = 0.83.

Table 4.4.6 shows the correlations amongst the three Knowledge Productivity Behaviour variables (i.e., Knowledge Acquisition, Knowledge Sharing and Knowledge Transfer). Based on the table it indicates that all three of the variables have significant relationships with each other at level p <.01, with strong pearson correlations in the range of .72** and above. This result of strong positive relationships between all Knowledge Productivity Behaviour variables is as expected.

Table 4.4.6 Pilot Study Sample: Correlations for Knowledge Productivity Behaviour

	1	2	3
1. Knowledge Acquisition	---	.76**	.72**
2. Knowledge Sharing		---	.79**
3. Knowledge Transfer			---

Note. $N = 30$. * $p < .05$; ** $p < .01$

4.5 Pilot Study: Relationships across Sets of Variables

The next sets of correlations provide an initial assessment of relationships implied by the theoretical model. That is, they explore the relationships of the five personality traits, which function in the model as independent variables, with the potential mediating variables of TPB, and with the outcome variables of knowledge productivity. Similarly, the relationships of the TPB variables with the knowledge productivity variables are explored. These relationships do not provide a full test of the model, and in addition, are based on a small sample size, so should be viewed as illustrative rather than definitive. Again, because of the small sample size, a liberal p-level of p<.10 was used to increase statistical power.

Table 4.5.1 Pilot Study Sample: Correlations for Personality Traits with Theory of Planned Behaviour Variables

	Attitude	Norm	PBC	Intention
Openness	.18	.13	.24	.13
Extraversion	.28	.11	.01	.13
Agreeableness	.19	-.02	.13	.14
Conscientiousness	.01	.01	.04	.02
Emotional Stability	.16	.10	.01	.02

Note. $N = 30$. * $p < .05$; ** $p < .01$

Table 4.5.1 shows that none of the Personality variables have statistically significant relationships with the Theory of Planned Behaviour variables. This result was not expected, as the theoretical model implies relationships between these two sets of variables.

Table 4.5.2 Pilot Study Sample: Correlations of Personality and Theory of Planned Behaviour with Knowledge Productivity Behaviour

	KA	KS	KT
Openness	.23	.32+	.11
Extraversion	.05	-.02	-.10
Agreeableness	.11	.20	-.05
Conscientiousness	.17	.25	.03
Neuroticism	-.17	-.06	-.25
Attitude	.22	.25	.04
Norm	.27	.45*	.29
PBC	.51**	.55**	.45*
Intention	.40*	.40*	.27

Note. $N = 30$. + $p < .10$;* $p < .05$; ** $p < .01$

Table 4.5.2 presents the correlations of the Knowledge Productivity Behaviour variables with the Personality and TPB variables. A handful of these variables had statistically significant relationships at the p <.10 level or better. There is a strong positive correlation between Perceived Behavioural Control and Knowledge Productivity Behaviour with pearson correlation in the range of .45* and above. Meanwhile, there are two other predictors that have positive correlation, which are Norm show positive correlation between Knowledge Sharing of .45* and Intention show positive correlation with Knowledge Acquisition and Knowledge Sharing of each .40*.In sum, Perceived Behavioural Control has significant relationship with dependent variable and the relationship was strong. On the other hand, the

rest of the predictors show no correlation with Knowledge Productivity Behaviour. PBC and Intention are conceptually most proximal to the KPB outcomes, so it makes sense that these show the strongest and mostly statistical significant relationships with KA, KS and KT.

4.6 Discussion and limitation of Pilot Study Sample Results

This section summarises the findings of the current pilot study. Limitations in study and methods of data analysis are also discussed, and recommendations are made for future research.

Sample size

The results of study were interpreted within the context of several limitations. Firstly is the issue of the pilot study sample size. One of the factors that affects the power of a statistical procedure is the sample size – other aspects being equal, larger sample sizes yield higher statistical power. With only the thirty (30) respondents participating in the pilot study, the lack of statistically significant relationships of the five personality traits, which function in the model as independent variables, with the potential mediating variables of TPB, and with the outcome variables of knowledge productivity is not too surprising. It is still expected that some of these hypothesized relationships involving the personality variables will be supported in the main study, given its substantially larger sample size and correspondingly higher statistical power.

Age

Secondly, in terms of the likely match of pilot study respondents' demographic characteristics with those expected in the main study, in the pilot study the respondents were predominantly in the younger age group (i.e., 70% were 25-34 years old). Perhaps their lack of working experiences influences their capacity towards knowledge productivity. Hence, the findings of this piloy study might not be generalizable to a population that includes a sizeable proportion of older academics. It is expected that the pattern of results might differ in the main study as the respondents may show greater age diversity, with more representation of mid- and later career academics.

p-level of p<.10

Furthermore, prior to small sample size, a liberal p-level of p<.10 was used to increase statistical power. Results showed positive correlations of PBC (Perceived Behavioural Control) and Intentions with Knowledge Productivity Behaviour. This makes sense as these two variables are conceptually more proximal to the KPB outcomes than the personality

variables. However, the rest of the TPB predictors showed few or no correlation with Knowledge Productivity Behaviour. Looking back, the lack of expected correlations is likely due to the small sample size. Thus, these relationships do not provide a full test of the model, and should not be viewed as the ultimate result.

Modifications to questionnaire

The pilot study findings provide justification that all the items and their associated constructs are stable and consistent. All five personality scales in the study had adequate reliability, with all values of alpha greater than .69. Similarly, all of TPB and KP variables indicated adequate reliability, with alpha coefficients of .87 or higher (TPB variables), and alphas of .75 or higher (KP variables). In addition, there were no indications of problems in the full set of hundred and two (102) items used to measure the three constructs, as the values of 'alpha if item deleted' did not indicate any problems.

However, after receiving qualitative feedback from respondents, the researcher chose to discard and change a few items for the main study to avoid repetitiveness and avoid confusing terms. Specific changes that were made involved changing a few terms such as "*academicians*" into "*academics*" and Knowledge Productivity response anchors of"*1-2 times this year*" into "*1-2 times this past 12 months*". The removed items (to shorten and avoid redundancy of content) are listed below.

Removed items
Attitude The idea of sharing my research knowledge with other collegues, is
Intention Over the next year, i will make an effort to publish a peer reviewed paper
Knolwedge transfer I worked on a report of research findings that is intended for submission to academic/ professional journals.

Thus, all the limitations has been addressed the researcher hoped that in the main study with expectation of larger sample all three different sets of variables (i.e., Five personality traits, Theory of Planned Behaviour, and Knowledge Productivity variables) results are improved and reliable for further analysis. In addition few changes has been made in order to establish effective questionnaire and consistency in answering the question.

4.7 Data Cleaning

A total of 1011 persons responded to the survey. Nevertheless, the size of the sample had been removed in the preliminary data cleaning process, resulting in useable data from a total 985 respondents who were in one of two major disciplinary units within the university system. The most prevalent reason for eliminating observations from analysis was that the participant identified himself or herself as a non-academic (N = 11). Some participants (N = 6) were also eliminated from the sample when their lack of responding to a set of items left their academic status in question (i.e., they did not complete descriptive items on the survey indicating their position, faculty and teaching capacity). In addition, a few respondents (N = 3) were dropped from further analysis because they failed to complete at least 80% of the survey items, and one respondent who was taking study leave was dropped. The data cleaning procedure resulted in useable responses from 749 respondents in the School of Social Sciences, and 236 useable responses from respondents in the School of Science and Technology.

Separate models and hypothesis tests were performed for the Social Sciences and the Science and Technology samples, using a structural equation modelling (SEM) approach. These analyses allowed an initial round of modelling conducted to see if the models were estimable in practice and also whether non-significant paths could be trimmed from the very complex initial model in order to make it simpler to estimate and to minimise problems due to multi-collinearity. The analysis of the separate samples is followed by multi-group analyses that allow testing whether the specifications of the latent constructs and also specific paths corresponding to the observed significant relationships amongst the variables are the same in both samples.

4.8 Social Science Sample

This section explains the results of analyses of data that have been collected from the Social Science sample. A total of 749 respondents have answered the questionnaire. The respondents are academics from Faculty of Information, Business & Management, Accountancy, Hotel & Tourism Management, Administrative Science & Policy Studies, Law, Art & Design, Academy of Language Studies, Communication & Media Studies, Academy of Contemporary Islamic Studies, Music, Education, and Film, Theatre & Animation.

4.9 Social Sciences Sample: Participant Descriptive Statistics and Work Characteristics

Following data cleaning and screening, descriptive analyses of participant demographic characteristics were performed. Table 4.9.1 provides an overview of these results.

Table 4.9.1 Social Science Sample: Demographic and Work Characteristics

Description	Frequency (n)	Percentage (%)
Gender		
Male	200	26.7
Female	545	72.8
Missing	4	.5
Age (in years)		
24-29	53	7.1
30-34	214	28.6
35-39	161	21.5
40-44	92	12.3
45-49	100	13.4
50-54	68	9.1
55-59	50	6.7
60-65	10	1.3
Missing	1	.1
Highest Qualification		
Bachelor's degree	12	1.6
Master's degree	546	72.9
Doctoral degree	187	25.0
Missing	4	.5
Years of Services		
1-11 months	22	3.3
1-4 years	117	15.4
5-9 years	278	38.4
10-14 years	122	15.5
15-19 years	100	13.0
20-24 years	41	5.0
25- 29 years	45	5.3
30-34 years	19	3.0
Missing	5	.7
Faculty Position		
Academic: Admin	277	37
Academic: Non- Admin	466	62.2
Missing	1	.4
Position Level		
Tutor, Contract, Part-time Lecturer	11	1.5
Lecturer	354	47.3
Senior Lecturer	325	43.4
Associate Professor	17	2.3
Professor	25	3.3

Missing	17	2.3
Teaching		
Undergraduate	563	75.2
Postgraduate	-	-
Undergraduate & postgraduate	182	24.3
Missing	3	1.3
Student Supervision		
None	207	27.6
Yes undergraduate only	338	45.1
Yes postgraduate only	-	-
Both undergraduate & postgraduate	38	5.1
Missing	166	22.2

Based on table 4.9.1, the majority of respondents (72.8%) were female. Respondents age varied in largest group aged in their thirties are 50.1%, followed by 25.7% in forties, 15.8% in fifties, and 7.1% in twenties, only few 1.3% in their sixties and 0.3% does not indicate their age. In terms of higher academic qualification, majority of them (72.9%) had their highest degree being a Master's degree, 25% had a Doctoral degree and 1.6% had a Bachelor's degree.

Meanwhile in terms of years of service, over a third (37.1%) of participants has 5-9 years of service. The next largest groups have 10-14 years of service (16.3%), 1-4 years of service (15.6%), or 15-19 years of service (13.4%). Of those remaining, 6% have 25-29 years of service, 5.5% have 20-24 years of service, 3.3% have 1-11 months of service, followed by 2.5% have 30-34 years of service and .7% reported missing. Thus, the main study sample provides considerably more representation of academics who have a longer tenure than did the pilot sample.

Looking at their faculty positions, 62.2 % indicated that they did not involved with administrative duties and 37% reported having some involvement with administrative duties while 0.4% does not indicate their positions. Furthermore, among the respondents, there are two largest group position; 47.3% held the position of lecturer and 43.4% senior lecturer, followed by 3.3% professor, 2.3% associate professor, and 1.5% tutor, contract part-time lecturer. Next 75.2% of the respondents reported teaching undergraduate students only, and the rest were involved in teaching both undergraduate and postgraduate students. Finally, with respect to the supervision of theses and dissertations, 45.1% undergraduate theses/dissertations only, 22.2% were not involved in supervision and 5.1% of the

respondents supervised both undergraduates and postgraduates consistent with the previous results largest teaching group of undergraduate students.

4.10 Assessment of Reliability and Descriptive Statistics for Social Science Sample Focal Variables

As was done in the pilot study, Cronbach's alpha was used to examine the internal reliability level of the sub-scales associated with the three focal constructs, using the previously mentioned guidelines from Malhotra (2004).

As shown by the values reported in Table 4.10.1, all five personality scales in the study are adequately reliable since all values of alpha were more than .67. Indeed, all of the values fall in the range suggesting good reliability. Therefore, the relationships among the items are reliable for further analysis. Next, all TPB variables indicate very strong reliability, with all alpha coefficients are .83 or higher. Therefore, it can be concluded that measurement for the TPB variables used is very acceptable and the relationships among the items are reliable for further analysis. This was an especially important finding, as in contrast to the instrument used to measure personality, the TPB items were developed by the study researcher to be specific to the KPB context. Finally, all Knowledge Productivity variables in the study are adequately reliable since the lowest alpha was .76 and for composite KPB .85. In addition, all twenty (20) items used to measure the three constructs are stable and consistent. In sum, the set of reliability analyses indicated that all twelve (12) constructs are stable and consistent. Therefore, scale scores created from the intended set of items are reliable for further analysis.

This following paragraph describes the univariate distributions of the main study focal variables, as well as describing the bivariate relationships within each of the three different sets of variables of Big Five Personality, Theory of Planned Behaviour and KPB variables.

Information in Table 4.10.1 indicates the overall mean of Big Five Personality. Results reported overall mean for Extraversion is 3.10, Agreeableness is 3.77, Conscientiousness is 3.72, Emotional Stability is 3.21, and Openness is 3.53, again suggesting that on average, participants tended to respond above the mid-point of the 5-point response scale. SD's were about half a scale point range from .46 (Agreeableness) to .64 (Emotional Stability). Although some of the values were statistically significant, the set of five personality variables

showed minimal skew. This was desirable, as it suggests that at least in a univariate sense these variables are close to normally distributed, an important assumption required for the later SEM analyses that will be conducted after this review is complete.

As shown by the values reported in Table 4.10.1 shows the descriptive analysis for the Theory of Planned Behaviour variables. Based on the table, the overall mean for Attitude is 6.10, Norm is 5.50, Perceived Behavioral Control is 5.10, and Intention is 5.70, suggesting that most respondents were favourably inclined towards presenting at conferences and publishing papers. Standard deviations range from .75 to 1.02. Based on the table, the highest skewness value is Attitude, which has a value of -.96. Again suggesting the suitability of these responses for later SEM analysis.

The results presented in Table 4.10.1 shows the overall means for the Knowledge Productivity Behaviour variables: Knowledge Acquisition m= 2.75, Knowledge Sharing m=2.94, Knowledge Transfer m= 2.21 and composite KPB m= -.021. This described that most of the respondents tend to respond above the mid-point of the 5-point response scale for KA and KS while below mid-point of the 5-point response scale for KT and composite KPB. The highest standard deviation is for Knowledge Sharing which is .93 while the lowest is Knowledge Acquisition which is.73. Again, although these are not particularly large, they should be sufficient for further analysis. Based on the table, the highest skewness value is KT, which has a value of .78. The kurtosis value for this variable is within the normal distribution range (-2 to 2) except Knowledge Transfer (KT), which has a value of 7.8.

Table 4.10.1 Social Science Study Sample: Descriptive Statistics for Focal Variables

Variables (Items)	α	Min	Max	Mean	SD	Skew	Kurtosis
Big Five Personality							
Extraversion	.76	1.30	5.00	3.10	.57	.04	.49
Agreeableness	.67	2.30	5.00	3.80	.46	.05	-.18
Conscientiousness	.74	1.70	5.00	3.72	.53	-.16	-.12
Emotional stability	.74	1.20	4.89	3.21	.64	-.06	-.22
Openness	.80	1.40	5.00	3.53	.48	.04	.34
Theory of Planned Behaviour							
Attitude	.87	2.14	7.00	6.10	.75	-.96	1.23
Norm	.83	2.44	7.00	5.50	.84	-.38	.02
PBC	.88	2.00	7.00	5.10	.99	-.32	-.12
Intention	.94	1.00	7.00	5.64	1.02	-.92	1.41
Knowledge Productivity Behaviour (KPB)							

Knowledge Acquisition (KA)	.76	1.00	5.00	2.80	.73	.28	-.05
Knowledge Sharing (KS)	.95	1.00	5.00	2.94	.93	.14	-.68
Knowledge Transfer (KT)	.93	1.00	5.00	2.21	.77	.78	.78
Composite KPB	.93	-2.17	3.35	.00	1.0	.35	-.02

Note. N = 749.

4.11 Social Science Sample: Correlations among Focal Variables

This next section describes the all possible bivariate relationships within each of the three different sets of variables (i.e., Big Five Personality, Theory of Planned Behaviour, and Knowledge Productivity variables).

Table 4.11.1 shows all bivariate relationships between pairs of Big Five Personality variables were positive. Extraversion, Agreeableness, Conscientiousness, Emotional Stability, and Openness all significantly and moderately related with each other, with values of the correlations ranging from .16 to .42. This is in contrast to the prior pilot study result in which with a small sample and restricted sample. The pilot study result, extraversion did not show significant relationships with the other variables.

Information in Table 4.11.1 reported the correlations amongst the Theory of Planned Behaviour Variables. As was true in the pilot study, all four of the TPB variables, i.e., Attitude, Norm Perceived Behavioural Control and Intention, have strong, positive, and statistically significant relationships with each other, with pearson correlations ranging from .51 to .69. These findings are consistent with the TPB general model, which suggests that intentions are a function of norms, perceived behavioural control and intentions. These relationships will be more formally modelled and tested in the later SEM analyses.

Table 4.11.1 present the correlations for Knowledge Productivity Behaviour Variables. Based on the table it indicates that all of the variables; Knowledge Acquisition, Knowledge Sharing, Knowledge Transfer and composite KPB has strong significant relationship at level p <.01 with pearson correlations in the range of .66 and above. The result shows that there are positive relationships between all Knowledge Productivity Behaviour variables. Given this set of strong relationships, it seems reasonable to also create a composite KPB variable that captures all three aspects of Knowledge Productivity Behaviours.

Table 4.11.1 Social Science Study Sample: Observed Correlation Matrix for Focal Variables

Variables (Items)	2	3	4	5	6	7	8	9	10	11	12	13
Big Five Personality												
1. Extraversion	.34**	.16**	.20**	.31**	.17**	.17**	.15**	.21**	.21**	.25**	.17**	.24**
2. Agreeableness	---	.42**	.32**	.38**	.22**	.22**	.18**	.22**	.09*	.18**	.05	.12**
3. Conscientiousness		---	.35**	.42**	.21**	.10**	.20**	.17**	.13**	.14**	.04	.12**
4. Emotional stability			---	.23**	.06	.05	.10**	.07	.07*	.13**	-.002	.08*
5. Openness				---	.22**	.15**	.34**	.32**	.32**	.37**	.26**	.36**
Theory of Planned Behaviour												
6. Attitude					---	.61**	.51**	.67**	.35**	.34**	.30**	.37**
7. Norm						---	.50**	.56**	.30**	.31**	.26**	.33**
8. PBC							---	.69**	.48**	.42**	.50**	.52**
9. Intention								---	.44**	.42**	.39**	.47**
Knowledge Productivity Behaviour (KPB)												
10. KA									---	.72**	.68**	.89**
11. KS										---	.66**	.89**
12. KT											---	.87**
13. Composite KPB												---

Note. N = 749. ** p < .01 ,* p < .05

4.12 Social Science Sample: Relationships across Sets of Variables

Further analysis based on correlation coefficients was used to evaluate the correlations between the variables that are implied by the theoretical model. That is, they explore the relationships of the three different sets of variables; Big Five Personality, Theory of Planned Behaviour, and Knowledge Productivity variables.

Table 4.12.1 shows the Social Science sample majority of the relationships between Personality traits and Theory of Planned Behaviour variables were statistically significant and in the expected (positive) direction. Majority of the variables are statistically significant at the 0.01 to 0.05 level except for Emotional Stability effects had no significant value with Attitude, Norm and Intention. The bivariate relationships of the Personality Traits with the Theory of Planned Behaviour variables are consistent with hypotheses H3a and H5. Specifically, they provide evidence for the proposed positive relationships of Openness with Attitude, (H3a), r= .23 and Conscientiousness with PBC (H5), r = .11. Unfortunately Emotional Stability with Attitude (H3b), r = .72 are not supported.

Table 4.12.1 Social Science Sample: Correlations for Personality Traits with Theory of Planned Behaviour Variables

	Attitude	Norm	PBC	Intention
Extraversion	.17**	.17**	.15**	.21**
Agreeableness	.22**	.22**	.18**	.22**
Conscientiousness	.21**	.10**	.20**	.17**
Emotional stability	.06	.05	.10**	.07
Openness	.22**	.15**	.34**	.32**

Note. $N = 749$. ** $p < .01$

The correlations in Table 4.12.2 all involve relationships of Knowledge Productivity Behaviours with the proposed antecedent Big Five personality and TPB variables. Results show a strong positive correlation between TPB variables and Knowledge Productivity Behaviour, resulted pearson correlations range of .26 and above. For example, results are consistent with hypotheses H2a, H2b, H2c and H2d. These hypotheses all dealt with the relationships of the TPB variables that were expected to have direct or mediating effects of the personality on Knowledge Productivity Behaviours. The results support the positive relationships with KPB of (a) Intention (H2a), r = .47; (b) Attitude (as implied by H2b), r = .37; (c) Norm (H2c), r = .33; and (d) PBC (H2d), r = .52.

Meanwhile, in contrast to prior results, the Big Five Personality variables show much better results in the main study than was found in the pilot study. This is not surprising due to the greater sample size (and their higher statistical power) of the Social Science Samples. Hypotheses H1a-H1e all dealt with the relationships of the personality variables with knowledge productivity behaviour. The top set of correlations in Table 4.12.2 address this issue in a bivariate manner. Reading down the right-hand column in the table, the results support the proposed positive relationships with KPB of extraversion (H1c), r = .24; Agreeableness (H1d), r = .13; Conscientiousness (H1e), r = .12; Emotional Stability (H1b), r = .08; and Openness (H1a), r = .36;. The results had a very similar pattern when looking at the three separate components of KPB, i.e., Knowledge Acquisition, Knowledge Sharing and Knowledge Transfer (see Table 4.12.2 for specific values). These results provide preliminary support for hypotheses, however, the hypothesis for Agreeableness, Conscientiousness and Emotional stability suggested a potential no correlations and not statistically significant with KPB constructs; KT.

Table 4.12.2 Social Science Sample: Correlations of Personality and Theory of Planned Behaviour with Knowledge Productivity Behaviour

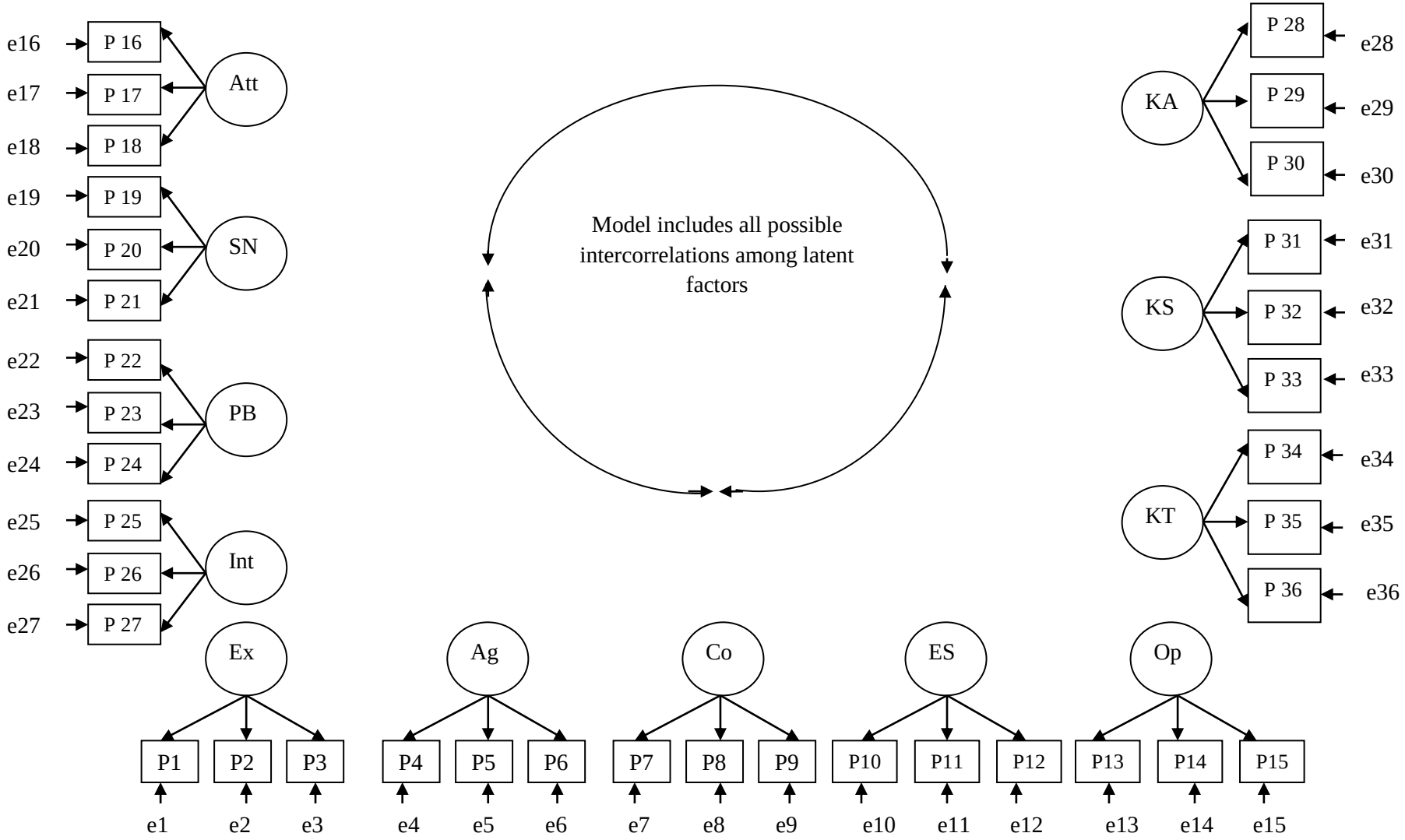
	KA	KS	KT	Composite KPB
Extraversion	.21**	.25**	.17**	.24**
Agreeableness	.09*	.18**	.05	.12**
Conscientiousness	.13**	.14**	.04	.12**
Emotional stability	.07*	.13**	-.002	.08*
Openness	.32**	.37**	.26**	.36**
Attitude	.35**	.34**	.30**	.37**
Norm	.30**	.31**	.26**	.33**
PBC	.48**	.42**	.50**	.52**
Intention	.44**	.42**	.39**	.47**

Note. $N = 749$. ** $p < .01$ * $p < .05$

4.13 Social Sciences Sample: Tests of Measurement Model

Before testing the research hypotheses, a test of the intended measurement model was made to ensure that it fit adequately to the data from the Social Sciences sample. The first measurement model consisted of twelve latent constructs that corresponded to the focal study variables, along with their measured indicators. In addition, a higher order Knowledge Productivity Behaviour construct was specified, which used the three latent constructs of Knowledge Acquisition, Knowledge Sharing and Knowledge Transfer as indicators. All of the latent constructs were allowed to freely intercorrelate, except for the three that served as the higher order KPB indicators. With the exception of the Knowledge Productivity Behaviour (KPB) variable of Knowledge Acquisition, which used four item-level responses as indicators for the latent construct, item parcels were used as measured indicators for each of the lower order latent constructs corresponding to the focal variables in the theoretical model. Three item parcels were used for each personality traits constructs (Openness, Conscientiousness, Extraversion, Agreeableness and Neuroticism), the four Theory of Planned Behaviour (TPB) constructs (Attitudes, Subjective Norms, Perceived Behavioural Control, Intentions) and the remaining two KPB constructs (Knowledge Sharing and Knowledge Transfer).

Figure 4.13.1 Social Sciences Sample: Measurement Model



Note. Item parcels are indicated with 'p'. Error variances are indicated with 'e'.

Table 413.2 Social Sciences Sample: Factor Loadings for Measurement Model

Latent Factor Indicator	Unstandardized Estimates		Standardized Estimate
	Estimate	s.e.	
Extraversion			
P1	.415	.033	.629
P2	.424	.037	.526
P3	.602	.037	.822
Agreeableness			
P4	.484	.036	.609
P5	.316	.027	.587
P6	.324	.031	.638
Conscientiousness			
P7	.401	.024	.688
P8	.520	.043	.555
P9	.400	.023	. 714
Emotional Stability			
P10	.672	.032	.699
P11	.570	.025	.742
P12	.858	.027	. 961
Openness			
P13	.523	.025	.830
P14	.308	.025	.529
P15	.425	.021	. 780
Intention			
P16	1.060	.040	.899
P17	1.025	.036	.987
P18	.895	.042	. 848
PBC			
P19	.987	.041	.801
P20	.723	.033	.746
P21	. 940	.037	. 803
Subjective Norm			
P22	. 692	.046	.590
P23	.737	.037	.779
P24	.767	.038	. 806
Attitude			
P25	. 769	.030	.894
P26	.690	.032	.836
P27	.656	.033	. 843
Knowledge Acquisition			
I28	.707	.033	.671
I29	.509	.034	.638
I30	.753	.035	.732
I31	.523	.034	.583
Knowledge Sharing			
P32	.870	.028	.819
P33	.906	.023	.930
P34	. 889	.035	. 895
Knowledge Transfer			
P35	.706	.027	.906
P36	.774	.025	.920
P37	. 758	.025	. 935

Note. All estimated factor loading are statistically significant at $p<0.001$

Table 4.13.3 Social Sciences Sample: Correlations for Measurement Model

	2	3	4	5	6	7	8	9	10	11	12	13
Big Five												
1. Extraversion	.49	.24	.24	.45	.24	.20	.20	.22	.30	.29	.30	.19
2. Agreeableness	---	.63	.36	.55	.29	.28	.32	.30	.17	.15	.23	.08
3. Conscientiousness		---	.42	.60	.24	.32	.22	.29	.20	.21	.20	.11
4. Emotional Stability			---	.30	.08	.12	.13	.11	.11	.14	.13	.00
5.Openness				---	.38	.44	.24	.30	.46	.45	.46	.31
Theory Planned Behaviour												
6. Intention					---	.78	.66	.73	.50	.51	.43	.41
7. PBC						---	.63	.61	.60	.61	.47	.55
8. Subjective Norm							---	.75	.42	.43	.39	.31
9. Attitude								---	.43	.44	.37	.34
Knowledge Productivity Behaviour												
10. KPB										---	---	---
11. Knowledge Acquisition										---	.87	.81
12. Knowledge Sharing												.72
13. Knowledge Transfer												

Note. All correlations come from Mean Model 1, except those directly involving the three KPB (11, 12, 13) components, which come from Model 2. A full Model 1 and Model 2 of the Social Sciences Sample: Correlations for Measurement Model is included in Appendix 8.

Table 4.13.4 Social Sciences Sample: Model Fit Statistics for Measurement Model

Model	X^2	df	ρ	RMSEA (90% CI)	CFI	SRMR
1	1659.792	579	<.001	.050 (.047, .053)	.923	.056
2	1585.560	561	<.001	049 (.047, .052)	.927	.054

Information in Table 4.13.4 indicates the overall model fit tests of the Measurement Model. Model 1 all dealt with the consisted of nine latent constructs that corresponded to the focal study variables with KPB outcomes. Model 2 dealt with twelve latent constructs, KPB construct was specified, which used the three latent constructs of Knowledge Acquisition, Knowledge Sharing and Knowledge Transfer as indicators. Reading down the information column in the table, the results shows the chi square and fit index of all Model1 and Model 2. In terms of chi-square test all Model has the reading less of, x^2 =1585.560 with 561 degree of freedom with p <.001. Meanwhile in absolute fit indexes all Models shows SRMR less than .056 indicates a good fit model and RMSEA less than .049 which suggest adequate fit model. With CFI results close to 1 indicates a very good fit, to accept all of model. Overall these results provide support for overall Model measurement.

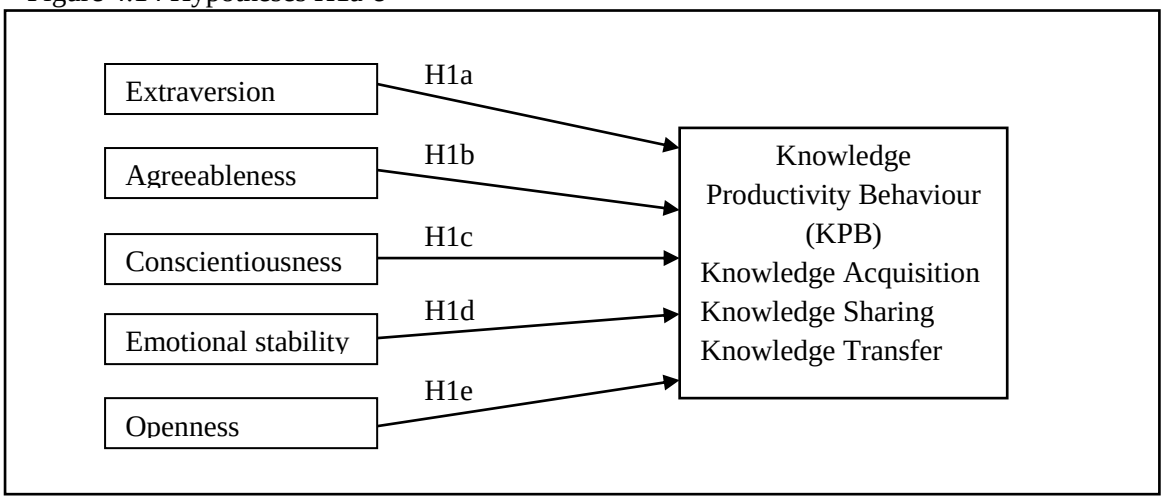
4.14 Social Sciences Sample, Tests of Hypotheses H1a-e: Relationships of Big Five to KPB Variables.

This section describes the Social Sciences sample results from testing structural equation models of the effects of the Big Five personality traits of Extraversion, Agreeableness, Conscientiousness, Emotional Stability, and Openness on Knowledge Productivity Behaviour (KPB). Thus, results from these models address Hypotheses H1a-e, which proposed that Openness, Emotional Stability and Conscientiousness has a positive relationships with KPB and Agreeableness may have both positive and negative relationships with KPB, resulting of an overall null association with KPB.

Two sets of models were estimated and reported in this section: (a) a set of models with a single, higher order KPB construct, and (b) a set of models in which the three KPB elements of knowledge acquisition, knowledge sharing and knowledge transfer were treated as separate latent constructs. In all of these models, the Big Five variables were treated as a set of simultaneous predictors, and either the higher order KPB variable, or the set of three KPB component variables were treated as outcome variables, as shown in illustrative Figure 4.14.

The models in which there was a single, higher order KPB variable test for effects of the Big Five on Knowledge Productivity Behaviours in general; the models with each of the three KPB components modeled separately allow one to see whether there are any differences in relationships depending upon the specific category of KPBs.

Figure 4.14 Hypotheses H1a-e



4.14.1 Effects of the Big Five on the Higher Order KPB Construct

Three models were estimated looking at the direct effects of the Big Five personality variables on the higher order KPB construct. Table 4.14.1.1 reports the overall model fit for each of these three models, and Table 4.14.1.2 reports the estimated path coefficients for the models. As can be seen in Table 4.14.1.1, although the chi-square goodness-of-fit statistics were statistically significant for all three models, the other indices of fit suggested that all three models fit acceptably well. The following paragraphs describe specifics of the models and the implications of the estimated path coefficients in each of these models.

4.14.2 Big Five Effects on Higher Order KPB Construct: Overall model fit and path coefficients

The specification of Model 1 included paths from latent constructs representing each of the Big Five variables to the higher order KPB construct. In addition, the Big Five variables were all allowed to freely inter-correlate with each other. As can be seen in Table 4.14.1.1, although the chi-square goodness of fit statistic of $X^2_{(255)}$ =943.256 was significant, other fit indices suggested Model 1 was close to fitting adequately. The results presented in the top portion of Table 4.14.1.2 indicate that two of the five personality variables had significant path coefficients when effects of all five personality variables were included in the model.

More specifically, in Model 1 there were statistically significant effects for Extraversion, β= .163, p= .008 and Openness, β= .497, p= <.001. The remaining three personality variables had non-significant path coefficients. Overall, Model 1 explained about 24% of the variance in the higher order KPB construct. Because the Big Five variables correlated amongst themselves to some extent (refer back to measurement model results), it was possible that there was enough shared variance amongst the set of five variables to hide otherwise significant effects on KPB. To investigate this, in the earlier stage, firstly a couple of additional trimmed models were estimated. In order to have standardized results, the author decided to trimming out models, since trimming up model yield much more sufficient outcomes for both T1 and T2 survey.

Table 4.14.1.1 Model Fit Statistics for Tests of H1a-H1e using the Higher Order KPB Construct

Model	X^2	df	ρ	RMSEA (90% CI)	CFI	SRMR
1	943.256	255	<.001	.060 (.056, .064)	.917	.063
2	943.283	256	<.001	.060 (.056, .064)	.917	.063
3	943.926	257	<.001	.060 (.056, .064)	.918	.063

Note. N = 749. RMSEA = Root Mean Square Error of Approximation; CFI = Comparative Fit Index; SRMR = Standardized Root Mean Square Residual.

Table 4.14.1.2 Tests of H1a-H1e: Path coefficients for relationships of Big Five to higher order KPB factor

	Unstandardized Coefficients			*Standardized Coefficients*
Model	***B***	***se***	***ρ***	***β***
Model 1: Predicting KPB from all Big 5 Predictors				
Extraversion	.267	.101	.008	.163
Agreeableness	-.197	.120	.101	-.143
Conscientiousness	-.083	.147	.573	-.048
Emotional stability	-.007	.047	.876	-.007
Openness	.653	.099	<.001	.497
R^2 = .241				
Model 2: Predicting KPB from Extraversion, Agreeableness, Conscientiousness and Openness				
Extraversion	.265	.101	.008	.162
Agreeableness	-.198	.120	.101	-.144
Conscientiousness	-.090	.139	.520	-.052
Emotional stability	-	-	-	-
Openness	.654	.099	<.001	.498
R^2 = .242				

Model 3: Predicting KPB from Extraversion, Agreeableness and Openness				
Extraversion	.290	.91	<.001	.177
Agreeableness	-.247	.97	.011	-.180
Conscientiousness	-	-	-	-
Emotional stability	-	-	-	-
Openness	.628	.89	<.001	.478
R^2 = .241				

In Model 2, all the traits were tested in order to find the most significant predictors, this model were trimmed out. Four effects were chosen to be tested which are Extraversion, Agreeableness, Conscientiousness and Openness (Emotional Stability effect on KPB was chosen to be trimmed out since it was not statistically significant in the model.) Model 2 also had a statistically significant chi-square statistic, as shown in Table 4.31.2, however, again the RMSEA, CFI and SRMR values suggested that it fit the data essentially as well as did Model 1. In Model 2, these two traits had statistically significant predictive path to the higher order KPB construct; Extraversion (β= .162, p=.008) and Openness (β= .498, p=<.001) remained statistically significant. The remaining effecst show non-significant path coefficients. . Overall, Model 2 shows 24% similar variance in the higher order KPB in Model 1.

Finally, Model 3 combination of Extraversion, Agreeableness and Openness as predictors had statistically significant of the higher order KPB construct. This model had a statistically significant chi-square for the test of overall model fit (as did the previous two models), indicating a significant degree of misfit in the model. Other fit indices suggested Model 3 was close to fitting adequately. In Model 3, with the strongest path Extraversion and Openness had statistically significant effects with p value range of <.001 and .011 for Agreeableness. Overall in Model 3 implies that these three predictors are needed to adequately capture all of the Big Five effects. Overall, Model 3 illustrates 24% consistent variance in the higher order KPB construct in Model 2 and Model 1.

4. 15 Effects of the Big Five on the KPB Components (KA, KS, KT)

In this next set of models, the Big Five variables were specified as predictors of the three separate lower-order KPB components, rather than combining the KPB components into a single higher order construct as was done for the previous set of analyses. This meant that there were three potential outcomes of the Big Five effects, namely, Knowledge Acquisition (KA), Knowledge Sharing (KS) and Knowledge Transfer (KT). Again, an initial model consistent with testing Hypotheses 1a-e was specified (Model 4), followed by two additional models (Models 5 and 6) that trimmed non-significant paths to KPB.

4. 15.1 Big Five Effects on KA, KS, and KT: Overall model fit and path coefficients

In this model, the Big Five variables were specified as predictors of all three KPB components. Models 4, 5 and 6 show the overall significant effects of the personality traits with three elements of KPB; KA (Knowledge Acquisition), KS (Knowledge Sharing) and KT (Knowledge Transfer). Model 4 includes all five of the personality predictors for each of the three outcome variables. The remaining models investigate the effects of trimmed models based on a procedure of removing the predictor(s) with the lowest contribution to the full model (i.e., Model 5 and 6).

Model 4 included paths from each of the Big Five variables to each of the three KPB lower order constructs. As can be seen in Table 4.15.1.1, the chi-square goodness of fit statistic of $X^2_{(245)}$ =907.296 was significant, however, other fit indices suggested Model 4 was close to fitting adequately. The results presented in the top portion of Table 4.15.1.2 shows the significant path coefficients for each of the KPB lower order constructs when effects of all five personality variables were included in the model. More specifically, in Model 4 three traits significantly predicted KA: Extraversion, β= .179, p= .007; Agreeableness, β= -.225, p= .018, and Openness β= .475, p= <.001 leaving Emotional Stability and Conscientiousness had non-significant path coefficients. For KS, there were significant results of Extraversion, β= .133, p= .026 and Openness, β= .474, p= <.001. For KT, two traits had significant effects of Openness, β= .367, p= <.001 and marginally significant for Extraversion, β= .127, p= .051.

Again, because the Big Five variables correlated amongst themselves to some extent, it was possible that there was enough shared variance to hide otherwise significant effects. To investigate this, a couple of models were trimmed out were estimated as was done previously for the higher order KPB models.

In Model 5, several paths from the Big Five to separate KPB constructs that were not statistically significant were trimmed, following the same procedure described earlier. With respect to overall model fit with combination of Extraversion and Openness effects, Model 5 also had a statistically significant chi-square statistic, as shown in Table 4.32.1.1. As results, three effects shows statistically significant for KA which is Openness with very strong effects of p = <.001, Extraversion with a p = .003 and Agreeableness p = .005. For KS, there were significant strong results of Openness with a p = <.001 and Extraversion with a p = .017. Meanwhile for KT, all of the remaining effects of Extraversion, Agreeableness, Emotional Stability shows statistically significant which is again with strong value of Openness with a p =<.001. Overall, Model 5 shows slightly less variance in the higher order KPB construct in Model 4 (for specific values please refer to Table 4.15.1.2).

Finally, in Model 6 this model had a statistically significant chi-square for the test of overall model fit (as did the previous two models), other fit indices suggested Model 6 was close to fitting adequately. Again, in order to get more significant effects, Model 6 demonstrates the results of significant effect of Openness for all three KPB component; KA, KS and KT. Yet again, the outcomes resulting very strong effects as all p-values of Openness are <.001 and leaving the remaining traits statistically significant. Overall in Model 6 implies that three predictors traits are needed to adequately capture effects for KPB constructs: KA (Extraversion, Agreeableness, Openness) and KS (Extraversion, Conscientiousness and Openness). Meanwhile four predictors Extraversion, Agreeableness, Emotional Stability and Openness traits are needed to adequately capture effects for KPB constructs: KT. Overall, Model 6 shows slightly less variance in the higher order KPB construct in Model 4 and 5 (for specific values please refer to Table 4.15.1.2).

Table 4.15.1.1 Overall model fit for tests of H1a-e

Model	x^2	df	ρ	RMSEA (90% CI)	CFI	SRMR
4	907.296	245	<.001	060 (.056, .064)	.920	.059
5	907.375	248	<.001	060 (.055, .064)	.921	.059
6	907.923	250	<.001	059 (.055, .063)	.921	.059

Note. N = 749. RMSEA = Root Mean Square Error of Approximation; CFI = Comparative Fit Index; SRMR = Standardized Root Mean Square Residual.

Table 4.15.1.2 Path coefficients from models of relationships of Big Five to higher order KA, KS and KT

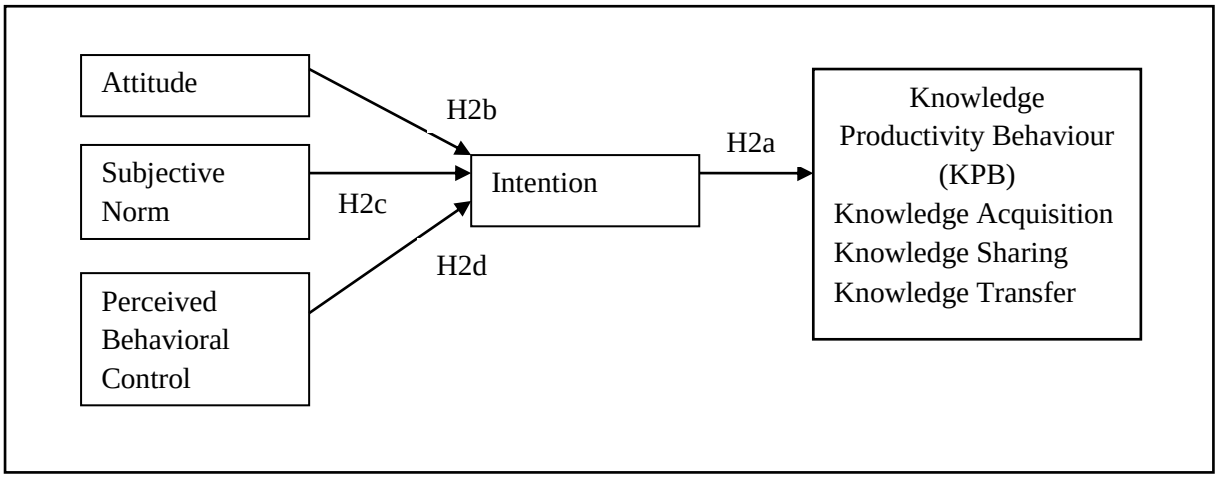
	Unstandardized Coefficients			*Standardized Coefficients*
Model	***B***	***se***	***ρ***	***β***
Model 4: Predicting KPB component from all Big 5 Predictors				
Outcome = KA				
Extraversion	.298	.111	.007	.179
Agreeableness	-.313	.132	.018	-.225
Conscientiousness	.012	.165	.944	.007
Emotional stability	.025	.051	.618	.025
Openness	.633	.108	<.001	.475
R^2 = .234				
Outcome = KS				
Extraversion	.281	.126	.026	.133
Agreeableness	-.062	.147	.671	-.036
Conscientiousness	-.226	.177	.203	-.103
Emotional stability	.019	.059	.740	.015
Openness	.799	.118	<.001	.474
R^2 = .230				
Outcome on KT				
Extraversion	.217	.111	.051	.127
Agreeableness	-.214	.131	.103	-.150
Conscientiousness	-.023	.155	.881	-.013
Emotional stability	-.087	.052	.094	-.082
Openness	.503	.096	<.001	.367
R^2 = .125				
Model 5				
KA: Prediction from Extraversion, Agreeableness, Emotional Stability and Openness				
Extraversion	.295	.101	.003	.177
Agreeableness	-.300	.107	.005	-.216
Conscientiousness	-	-	-	-
Emotional stability	.015	.037	.672	.015
Openness	.637	.095	<.001	.478
R^2 = .233				
KS: Prediction from Extraversion, Agreeableness, Conscientiousness and Openness from measurement model				
Extraversion	.284	.119	.017	.135
Agreeableness	-.058	.134	.667	-.033
Conscientiousness	-.213	.119	.074	-.097
Emotional stability	-	-	-	-
Openness	.797	.110	<.001	.473
R^2 = .230				
KT: Prediction from Extraversion, Agreeableness, Emotional Stability and Openness				
Extraversion	.223	.096	.020	.130
Agreeableness	-.220	.102	.031	-.154
Conscientiousness	-	-	-	-

Emotional stability	-.099	.040	.013	-.094
Openness	.497	.088	<.001	.363
R^2 = .126				
Model 6				
KA: Prediction from Extraversion, Agreeableness, Openness				
Extraversion	.286	.099	.004	.172
Agreeableness	-.267	.086	.002	-.192
Conscientiousness	-	-	-	-
Emotional stability	-	-	-	-
Openness	.627	.090	<.001	.471
R^2 = .228				
KS: Prediction from Extraversion, Conscientiousness and Openness				
Extraversion	.260	.108	.016	.124
Agreeableness	-	-	-	-
Conscientiousness	-.247	.099	.013	-.113
Emotional stability	-	-	-	-
Openness	.789	.105	<.001	.468
R^2 = .229				
KT: Prediction from Extraversion, Agreeableness, Emotional Stability and Openness				
Extraversion	.215	.096	.025	.126
Agreeableness	-.194	.089	.030	-.136
Conscientiousness	-	-	-	-
Emotional stability	-.106	.036	.003	-.100
Openness	.488	.084	<.001	.356
R^2 = .123				

4.16 Social Sciences Sample, Tests of Hypotheses H2a-e: Relationships of Theory of Planned Behaviour (TPB) to KPB Variables

This section describes the results from testing structural equation models of the effects of the Theory of Planned Behaviour (TPB) to higher order KPB (Knowledge Productivity Behaviour) construct, as well as the three KPB elements, i.e., knowledge acquisition, knowledge sharing and knowledge transfer. In all of these models, the Theory of Planned Behaviour variables were treated as predictor variables and the higher order KPB variable as outcomes, or the set of three KPB component variables as shown in illustrative Figure 4.16. As well as testing the hypothesis within each of the different sets of predictors, the results from these models address Hypotheses H2a-d, which proposed that Intention, has positive direct relationships with KPB and the effects of Attitude, Subjective norms and PBC has mediating effects on KPB via Intentions.

Figure 4.16 Hypotheses H2a-e



4.16.1 Effects of the Theory of Planned Behaviour (TPB) on the Higher Order KPB Construct

Two models were estimated looking at the direct effects of the Theory of Planned Behaviour (TPB) on the higher order KPB construct. The first model is totally consistent with the pattern of hypothesised relationships, the remaining model uses information from the first estimation to trim non-significant paths from the original model. Table 4.16.1.1 reports overall model fit for each of these two models, and Table 4.16.1.2 reports the estimated path coefficients for the models. As can be seen in Table 4.16.1.1, although the chi-square goodness of fit statistics was significant, other indices of fit suggested that all two models had an acceptable level of fit. The following paragraphs describe specifics of the models and the implications of the estimated path coefficients in each of these models.

4.16.2 Structural Models of Theory of Planned Behaviour (TPB): Overall model fit and path coefficients

This next section describes models specified to test Hypotheses H2a-d, proposing relationships of the TPB variables with Knowledge Productivity Behaviour. All of the models in this section used a higher order KPB construct as the outcome variable.

Model 1.1 included paths from each of the behavioural component to the higher order of each KPB variable. As can be seen in Table 4.16.1.1, the chi-square goodness of fit statistic of $X^2_{(198)}$ =778.714 was significant, other fit indices suggested Model 1.1 was close to fitting adequately. The results presented in the top portion of Table 4.16.1.2 shows the behavioural component variables significant path coefficients when effects of all behavioural component

variables were included in the model. The results presented in the top portion of Table 4.16.1.2 indicate that both of Model 1.1 and Model 2.2 Intention components had significant path coefficients with KPB with 26% variance remained the same. Table 4.16.1.2 indicate that only one behavioural component (Subjective Norm with values of β= .042, p= .532) had none significant path coefficients when effects of all two variables were included in the model. The remaining two; Attitude and PBC shows strong significant effects on Intention which has a value of p= <.001. Overall, Model 1.1 explained a total of about 72% of the variance in the on Intention. Because the Theory of Planned Behaviour variables correlated amongst themselves to some extent, it was possible that there was enough shared variance to hide otherwise significant effects. To investigate this, a couple of trimmed models were estimated.

Model 2.2 was identical to Model 1.2, except it fixed the path from Subjective Norm to the KPB construct to zero. (The Subjective Norm effect was chosen to be removed since it was not statistically significant and had the highest p-value in the previous model.) Model 2.2 also had a statistically significant chi-square statistic, as shown in Table 4.16.1.1, the RMSEA, CFI and SRMR values suggested that it fit the data as in Model 1. Again, in Model 2.2, the effect of Attitude and PBC shows strong significant path coefficients on Intention. Overall, Model 2.2 shows similar 72% of the variance in Intention.

Table 4.16.1.1 Overall model fit for tests of H2a-H2e

Model	x^2	df	ρ	RMSEA (90% CI)	CFI	SRMR
1.1	778.714	198	<.001	.063 (.058, .067)	.952	.056
2.2	779.387	199	<.001	.062 (.058, .067)	.952	.057

Note. N = 749. RMSEA = Root Mean Square Error of Approximation; CFI = Comparative Fit Index; SRMR = Standardized Root Mean Square Residual.

Table 4.16.1.2 Path coefficient from models of relationships of TPB to higher order KPB factor

	Unstandardized Coefficient			*Standardized Coefficient*
Model	***B***	***se***	ρ	β
Model 1.1: Predicting KPB from all TPB Predictors				
KPB on				
Intention	.337	.029	<.001	.516
R^2 = .267				
Intention on				
Attitude	.518	.077	<.001	.375

Subjective norm	.064	.102	.532	.042
PBC	.597	.061	<.001	.534
R^2 = .723				
Model 2.2: Dropping Subjective Norm				
KPB on				
Intention	.337	.029	<.001	.516
R^2 = .267				
Intention on				
Attitude	.552	.059	<.001	.400
Subjective norm	-	-	-	-
PBC	.611	.055	<.001	.547
R^2 = .725				

4.17 Social Sciences Sample, Effects of the Theory of Planned Behaviour (TPB) on the KPB Components (KA, KS, KT)

In the next set of models, the Theory of Planned Behaviour variables were specified as predictors of all three KPB components. Model 3.3 and 4.4 shows the overall significant effects of the behavioural component with three elements of KPB; KA (Knowledge Acquisition), KS (Knowledge Sharing) and KT (Knowledge Transfer).

4.17.1 Structural Models of Theory of Planned Behaviour (TPB) on the KPB Components (KA, KS, KT): Overall model fit and path coefficients

In the next set of models, the Theory of Planned Behaviour variables were specified as predictors of all three KPB components. Model 3.3 and 4.4 show the overall significant effects of the behavioural component with three elements of KPB; KA (Knowledge Acquisition), KS (Knowledge Sharing) and KT (Knowledge Transfer). Model 3.3 includes all behavioural component predictors for each of the three outcome variables. The remaining models investigate the effects of trimming some of the non-significant paths from the full model (i.e., Model 4.4).

Table 4.17.1.2 shows the overall significant all four behavioural effects with three elements of KPB; KA (Knowledge Acquisition), KS (Knowledge Sharing) and KT (Knowledge Transfer) were included in the model. Model 3.3 included paths from each of the behavioural component to the higher order of each KPB variable. As can be seen in Table 4.17.1.1, the chi-square goodness of fit statistic of $X^2_{(196)}$ =777.926 was significant, other fit indices suggested Model 3.3 was close to fitting adequately.

The results presented in the top portion of Table 4.17.1.2 shows the behavioural component variables significant path coefficients when effects of all behavioural component variables were included in the model. The results presented in the top portion of Table 4.17.1.2 indicate that both of Model 3.3 and Model 4.4 Intention components had significant path coefficients with KPB with variance remained the same for both model for each of KPB elements. Table 4.17.1.2, again indicate that only one behavioural component (Subjective Norm with values of β= .041, p= .533) had none significant path coefficients when effects when all two variables were included in the model. The remaining two; Attitude and PBC shows strong significant effects on Intention which has a value of p= <.001. Overall, Model 3.3 explained a total of about 72% of the variance in the on Intention. Because the Theory of Planned Behaviour variables correlated amongst themselves to some extent, it was possible that there was enough shared variance to hide otherwise significant effects. To investigate this, a couple of trimmed models were estimated.

In order to get more significant effects, Model 4.4 fixed the path from Subjective Norm to the KPB construct to zero. Model 4.4 also had a statistically significant chi-square statistic, as shown in Table 4.17.1.1, the RMSEA, CFI and SRMR values suggested that it fit the data as in Model 3.3. As a result, again in Model 4.4, the effect of Attitude and PBC shows strong significant path coefficients on Intention. Overall, Model 4.4 shows similar 72% of the variance in Intention.

Table 4.17.1.1 Overall model fit for tests of H2a-H2e

Model	x^2	df	ρ	RMSEA (90% CI)	CFI	SRMR
3.3	777.926	196	<.001	.063 (.058, .068)	.952	.056
4.4	778.596	197	<.001	.063 (.058, .067)	.952	.057

Note. N = 749. RMSEA = Root Mean Square Error of Approximation; CFI = Comparative Fit Index; SRMR = Standardized Root Mean Square Residual.

Table 4.17.1.2 Path coefficient from models of relationships of TPB to higher order KPB factor

	Unstandardized Coefficient			*Standardized Coefficient*
	B	**se**	***ρ***	***β***
Model 3.3: Predicting KPB from all TPB Predictors				
KA on				
Intention	.346	.032	<.001	.525
R^2 = .276				
KS on				
Intention	.363	.031	<.001	.443
R^2 = .196				
KT on				
Intention	.279	.022	<.001	.418
R^2 = .175				
Intention on				
Attitude	.518	.077	<.001	.375
Subjective norm	.064	.102	.533	.041
PBC	.597	.061	<.001	.534
R^2 = .723				
Model 4.4: Dropping Subjective Norm				
KA on				
Intention	.346	.032	<.001	.525
R^2 = .276				
KS on				
Intention	.363	.031	<.001	.443
R^2 = .196				
KT on				
Intention	.279	.022	<.001	.419
R^2 = .175				
Intention on				
Attitude	.552	.059	<.001	.400
Subjective norm	-	-	-	-
PBC	.611	.055	<.001	.547
R^2 = .725				

4.18 Social Sciences Sample, Tests of the Mediating Role of Intention in the Relationships of Attitude, Subjective Norm and Perceived Behavioural Control with KPB

Prior towards above model, this section describes the results from testing of the mediating effects of Intention in the Relationships of Attitude, Subjective Norm and Perceived Behavioural Control with KPB as well as the three KPB constructs, i.e., knowledge acquisition, knowledge sharing and knowledge transfer as shown in illustrative Figure 4.16. Thus, results from these models address Hypotheses H2a-d, which proposed Attitude, Subjective norms and PBC has mediating effects on KPB via Intentions.

4.18.1 Effects of mediating role of Intention in Attitude, Subjective Norm and Perceived Behavioural Control with KPB

A total of three hypotheses were estimated looking at the mediating effects of Intention in the Relationships of Attitude, Subjective Norm and Perceived Behavioural Control with KPB. The first results presented in Table 4.18.1.1 shows the mediating effect of Intention when effects of all behavioural component variables were included in the model. The results presented in the table shows that all Sub-model H2a-d (i) indicate Intention components had significant effects in Attitude and PBC with KPB with value of p= <.001, leaving only one behavioural component Subjective Norm had none significant effects with p values of .410. Subsequently, the second results presented Sub-model H2a-d (ii) dropped Subjective Norm, reported that remaining Attitude and PBC remained strongly statistically significant effects.

Table 4.18.1.1 Effects of mediating role of Intention in Attitude, Subjective Norm and Perceived Behavioural Control with KPB

	Unstandardized Coefficient			***Standardized Coefficient***
Effects of Intention mediating role	***B***	***se***	***ρ***	***β***
Submodel H2a- d (i)				
KPB				
Attitude to KPB via intention	.174	.025	<.001	.194
Norm to KPB via intention	.021	.026	.410	.021
PBC to KPB via intention	.201	.023	<.001	.276
Submodel H2a- d (ii): Dropping Subjective Norm				
KPB				
Dropping Subjective Norm				
Attitude to KPB via intention	.186	.022	<.001	.207
PBC to KPB via intention	.206	.023	<.001	.282

4.19 Social Sciences Sample, Tests of the Mediating Role of Intention in the Relationships of Attitude, Subjective Norm and Perceived Behavioural Control with KPB constructs (KA, KS, KT)

Prior towards above model, this section describes the results from testing of the mediating effects of Intention in the Relationships of Attitude, Subjective Norm and Perceived Behavioural Control with three KPB constructs, i.e., knowledge acquisition, knowledge sharing and knowledge transfer as shown in illustrative Figure 14.6. Thus, results from these models address Hypotheses H2a-d, which proposed Attitude, Subjective norms and PBC has mediating effects on KPB Constructs; KA, KS and KT via Intentions.

4.19.1 Effects of mediating role Effects of mediating role of Intention in Attitude, Subjective Norm and Perceived Behavioural Control with KPB

A total of three hypotheses were estimated looking at the mediating effects of Intention in the Relationships of Attitude, Subjective Norm and Perceived Behavioural Control with KPB constructs (KA, KS, and KT). The results presented in Table 4.19.1.1 shows the mediating effect of Intention when effects of all behavioural component variables were included in the model. The results presented in the table shows that all Sub-model H2a-d (i) indicate Intention components had significant effects in Attitude and PBC with KA, KS and KT with value of p= <.001, leaving only one behavioural component Subjective Norm had none significant effects with p values less than .411. Subsequently, Sub-model H2a-d (ii) dropped Subjective Norm, reported that again Attitude and PBC remained strongly statistically significant effects for all KA, KS and KT.

Table 4.19.1.1 Effects of mediating role of Intention in Attitude, Subjective Norm and Perceived Behavioural Control with KA, KS and KT

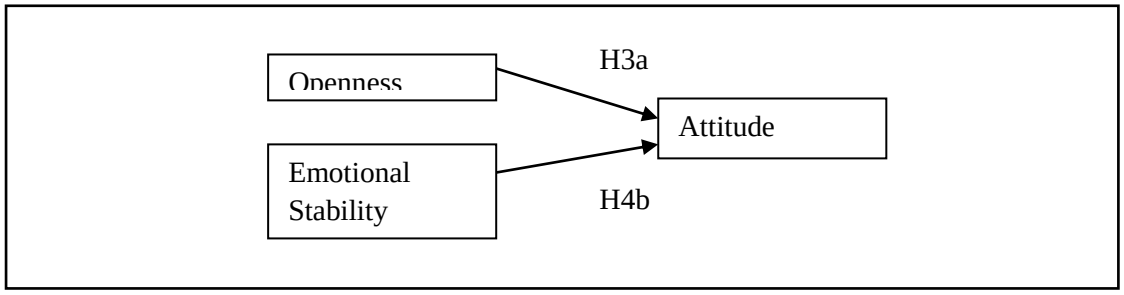
	Unstandardized Coefficient			***Standardized Coefficient***
Effects of Intention mediating role	***B***	***se***	***ρ***	***β***
Submodel H2a- d (i)				
KA				
Attitude to KA via intention	.179	.027	<.001	.197
Norm to KA via intention	.022	.027	.411	.022
PBC to KA via intention	.207	.024	<.001	.280
KS				
Attitude to KS via intention	.188	.027	<.001	.166
Norm to KS via intention	.023	.028	.411	.018
PBC to KS via intention	.217	.025	<.001	.237
KT				
Attitude to KT via intention	.144	.021	<.001	.157
Norm to KT via intention	.018	.022	.411	.017
PBC to KT via intention	.166	.019	<.001	.224
Submodel H2a- d (ii): Dropping Subjective Norm				
KA				
Dropping Subjective Norm				
Attitude to KA via intention	.191	.023	<.001	.210
PBC to KA via intention	.212	.024	<.001	.287
KS				
Dropping Subjective Norm				
Attitude to KS via intention	.200	.024	<.001	.177
PBC to KS via intention	.222	.024	<.001	.242
KT				

Dropping Subjective Norm				
Attitude to KT via intention	.154	.018	<.001	.167
PBC to KT via intention	.170	.019	<.001	.229

4.20 Social Sciences Sample, Tests of Hypotheses H3a and H3b: Relationships of Openness and Emotional Stability traits on Attitude

This section describes the results from testing structural equation models of the effects of the Big Five personality traits (Openness and Emotional Stability) on Attitude as shown in illustrative Figure 3. Thus, results from these sub-models address Hypotheses H3a-b, which proposed that Openness and Emotional Stability has positive direct relationships Attitude.

Figure 4.20 Hypotheses H3a-b



4.20.1 Hypothesis H3a and H3b, Effects of the Emotional Stability traits and Openness on Attitude

A sub-model was estimated to specifically investigate the effects of the Big Five variables of Openness and Emotional Stability on Attitude, as proposed in Hypotheses H3a-b. Table 4.22.2 reports overall model fit for each of this model, and Table 4.20.1.2 reports the estimated path coefficients for the model. As can be seen in Table 4.20.1.1, although the chi-square goodness of fit statistics was significant, other indices of fit suggested that the models had an acceptable level of fit. The following paragraphs describe specifics of the model and the implications of the estimated path coefficients in this model.

This next section describes sub-models specified to test Hypotheses H3a and H3b for their direct effects, proposing relationships of the Big Five Emotional Stability and Openness traits on and TPB variable of Attitude.

Sub-model H3a-b shows the overall significant effects of the two personality traits on Attitude. As can be seen in Table 4.20.1.1, the chi-square goodness of fit statistic of $X^2_{(24)}$ = 63.331 was significant, other fit indices suggested Model H3a-b was close to fitting

adequately. The results presented in the top portion of Table 4.20.1.2 indicate that only one variable had significant path coefficients on Attitude. More specifically, in this model only Openness were statistically significant effects for Attitude, with values of β= .289, p= <.001. Overall, H3a-b explained a total of about 88% of the variance.

Table 4.20.1.1 Overall model fit for tests of H3a-b

Hypo	x^2	df	ρ	RMSEA (90% CI)	CFI	SRMR
H3a-H3b	63.331	24	<.001	.047 (.033, .061)	.983	.036

Note. *N* = 749. RMSEA = Root Mean Square Error of Approximation; CFI = Comparative Fit Index; SRMR = Standardized Root Mean Square Residual.

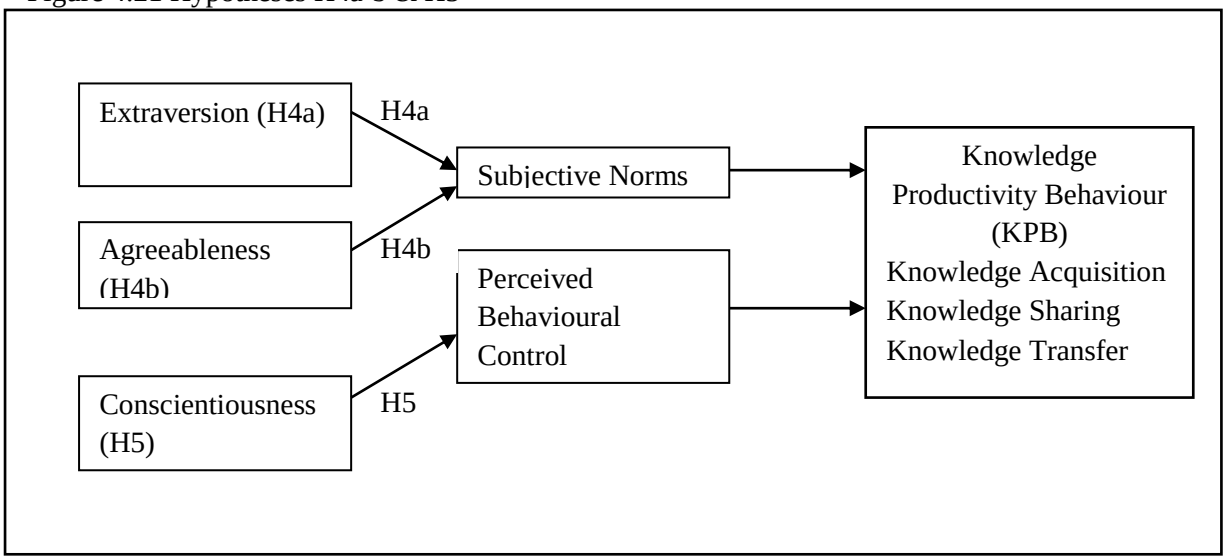
Table 4.20.1.2 Relationships of Emotional Stability traits and Openness on Attitude

	Unstandardized Coefficient			***Standardized Coefficient***
Model	***B***	***se***	***ρ***	***β***
Model H3a-b: Relationship of Emotional Stability traits and Openness on Attitude				
Attitude on				
Emotional Stability	.024	.047	.615	.022
Openness	.418	.073	<.001	.289
R^2 = .88				

4.21 Social Sciences Sample, Tests of Hypotheses H4a-b and H5: Interactions of Traits and Behaviour on Intention

This section describes the results from testing structural equation models of the interaction effects of selected Big Five personality traits (Extraversion, Agreeableness and Conscientiousness) with the TPB variables of Subjective Norms and Perceived Behavioural Control on Intention, as shown in illustrative Figure 4. Thus, results from these models address Hypotheses H4a-b, which proposed that the relationship of subjective norms with intentions to engage in academic productivity behaviours is positively moderated by Extraversion (H4a) and Agreeableness (H4b) and the relationship of PBC with intentions to engage in KPB is positively moderated by Conscientiousness (H5).

Figure 4.21 Hypotheses H4a-b & H5



4.21.1 Interactions of Traits and Behaviour on Intention

A model was estimated looking at the interactions of the Big Five and TPB variables on Intention. Table 4.21.1.1 reports overall model fit for each of this model, and Table 4.21.1.2 reports the estimated path coefficients for the model. As can be seen in Table 4.21.1.1, although only two (H4b and H5) of the chi-square goodness of fit statistics was significant, other indices of fit suggested that the models had an acceptable level of fit. The following paragraphs describe specifics of the model and the implications of the estimated path coefficients in this model.

In this set of sub-model, Big Five and TPB variables on Intention were estimated for their interactions effects. Model H4a-b and H5 shows the overall significant effects of the Big Five personality traits, TPB and their interaction on Intention.

In Model H4a as can be seen in Table 4.21.1.1, has the reading of less of $X^2_{(42)}$ = 56.791, resulting hypothesis were not supported although the p- values of H4a (p= 0.63) were not far from significant. Model H4a included path from Extraversion, Norm and interactions from NormxExtraversion on Intention. The results indicate that Norm with a value of β= .631, p= <.001and Extraversion β= .110, p= .017 had significant path coefficients on Intention and leaving interactions from NormxExtraversion with a value of β= .019, p= .751 on Intention non-significant. Overall, H4a explained a total of about 43% of the variance.

Model H4b has the reading of, x^2 =205.969 with 43 degree of freedom with p= .063. Meanwhile in absolute fit indexes Model shows SRMR less than .064 indicates a good fit

model and RMSEA less than .071 which suggest adequate fit model. With CFI results close to 1 indicates a very good fit, to accept all of model. Overall these results provide support for hypotheses testing of H4b. Model H4b included path from Agreeableness, Norm and interactions from NormxExtraversion on Intention. The results indicate that only Norm had significant path coefficients on Intention with a value of β= .626, p= <.001 and leaving remaining Agreeableness value of β= .081, p= .085 and NormxExtraversion value of β= -.041, p= .548 on Intention non-significant. Overall, H4b explained a total of about 44% of the variance.

In Model H5 as can be seen in Table 4.21.1.1, although the chi-square goodness of fit statistic of $X^2_{(42)}$ =66.948 was significant, other fit indices suggested Model H5 was close to fitting adequately. Overall these results provide support for hypotheses testing of Model H5. Model H5 included path from Conscientiousness, PBC interactions from PBCxConscientiousness on Intention.

The results presented in the top portion of Table 4.21.1.2 indicate only one variable had significant path coefficients on Intention. More specifically, in this model there were statistically significant effect for PBC, with values of β= .794, p= <.001, Conscientiousness, with values of β= -.049, p= .390 and PBCxConscientiousness with values of β= -.143, p= .260. Conscientiousness and PBCxConscientiousness had non-significant interactions on Intention. Overall, H5 explained a total of about 62% of the variance.

Table 4.21.1.1 Overall model fit for tests of H4a-b and H5

Hypo	x^2	df	ρ	RMSEA (90% CI)	CFI	SRMR
H4a	56.7918	42	.063	.022 (.000, .035)	.992	.038
H4b	66.948	42	.008	028 (.014, .040)	.988	.030
H5	205.969	43	<.001	071 (.062, .081)	.930	.064

Note. N = 749. RMSEA = Root Mean Square Error of Approximation; CFI = Comparative Fit Index; SRMR = Standardized Root Mean Square Residual.

Table 4.21.1.2 Interactions of Big Five and TPB on Intention

	Unstandardized Coefficients			*Standardized Coefficients*
Hypothesis	***B***	***se***	***ρ***	***β***
Hypothesis H4a: Interactions of Extraversion with Norm and Intentions				
Intention on				
Norm	.951	.076	<.001	.631
Extraversion	.266	.112	.017	.110
NormxEx	.057	.179	.751	.019
R^2 = .438				
Hypothesis H4b: Interactions of Agreeableness with Norm and Intentions				
Intention on				
Norm	.927	.079	<.001	.626
Agreeableness	.213	.123	.085	.081
NormxAgree	-.155	.258	.548	-.041
R^2 = .435				
Hypothesis H5: Interactions of Conscientiousness with PBC and Intentions				
Intention on				
PBC	.884	.061	<.001	.794
Conscientiousness	-.116	.135	.390	-.049
PBCxCons	-.486	.432	.260	-.143
R^2 = .627				

4.22 Summary of Results

Table 4.22.1 shows the summary of hypotheses testing (H1a-e and H2a-d) based on the estimation of Social Science sample. Information in the table below indicating that when all the Big Five variables were specified as predictors of all three KPB components, only three hypotheses were supported significantly predicted KPB which are h1a, h1c and h1d. Meanwhile, in this model results for Hypothesis of H2a-d testing of direct effects of the Theory of Planned Behaviour (TPB) and higher order KPB indicates that all hypotheses were supported, except for H2c. The KPB and KPB elements were predicted mainly by the behavioural intentions whereas attitude and PBC predicted the behavioural intentions.

Information in Table 4.22.2 reported results of hypothesis H2b-d testing on mediating effects of the Theory of Planned Behaviour (TPB) to higher order KPB. Results reported that all hypotheses except H2c were supported in this sub-model, behavioural intentions significantly have a mediated effect on KPB, and attitude and PBC have mediated effect on Behavioural

Intentions. However, Subjective Norms did not have mediated effects on behavioural intentions for KPB.

Table 4.22.3 information reported results of Hypotheses H4a-b and H5, looking at the interactions of the Big Five and TPB variables on Intention, which proposed that the relationship of subjective norms with intentions to engage in academic productivity behaviours is positively moderated by Extraversion (H4a) and Agreeableness (H4b) and the relationship of PBC with intentions to engage in KPB is positively moderated by Conscientiousness (H5) all the hypotheses reported were not supported. For full information please refer to Appendix 6.

Table 4.22.1 Summary of Hypothesis Testing regarding effects of KPB

	Statement of hypotheses H1a-e (B5)	**Standardized effect**	**Results indicate for higher order KPB**
H1a	*Openness has a positive relationship with Knowledge Productivity Behaviour.*	.478	Supported
H1b	*Emotional stability has a positive relationship with Knowledge Productivity Behaviour.*	---	Not supported
H1c	*Extraversion has a positive relationship with Knowledge Productivity Behaviour.*	.177	Supported
H1d	*Agreeableness may have either positive or negative relationships with Knowledge Productivity Behaviour.*	-.180	Supported
H1e	*Conscientiousness has a positive relationship with Knowledge Productivity Behaviour.*	---	Not supported
	Statement of hypotheses H2a-d (TPB)	**Standardized effect**	**Results indicate for higher order KPB**
H2a	*Intention to engage in research activities has a direct, positive effect on Knowledge Productivity Behaviour.*	.525	Supported
H2b	*Attitude towards publishing/presenting has a positive, direct effect on behavioural intention*	.400	Supported
H2c	*Subjective Norms about academic productivity pressure (i.e., peer and superior) have a positive direct effect on behavioural intention.*	---	Not supported
H2d	*Perceived Behavioural Control towards capabilities in publishing has positive direct effects on behavioural intention.*	.547	Supported

Table 4.22.2 Summary of mediating effects of TPB variables and KPB

	Statement of hypotheses H2b-d (mediating effects)	Standardized effect	Results
H2b	*Attitude towards publishing/presenting has a mediated effect on Knowledge Productivity Behaviour via behavioural intention.*	.207	Supported
H2c	*Subjective Norms about academic productivity pressure (i.e., peer and superior) have a mediated effect on Knowledge Productivity Behaviour via behavioural intention.*	---	Not supported
H2d	*Perceived Behavioural Control towards capabilities in publishing have a mediated effect on Knowledge Productivity Behaviour via behavioural intention.*	.282	Supported

Table 4.22.3 Summary of direct and indirect effects of Big Five and TPB variables

	Statement of hypotheses H3-H5	Standardized effect	Results
H3a	*Openness is positively related to Attitude towards publishing/presenting.*	.289	Supported
H3b	*Emotional stability is positively related to Attitude towards publishing/presenting.*	---	Not supported
H4a	*The relationship of Subjective Norms with intentions to engage in academic productivity behaviours is positively moderated by Extraversion.*	---	Not supported
H4b	*The relationship of Subjective Norms with intentions to engage in academic productivity behaviours is positively moderated by Agreeableness.*	---	Not supported
H5	*Conscientiousness is positively related to Perceived Behavioural Control towards capabilities in publishing.*	---	Not supported

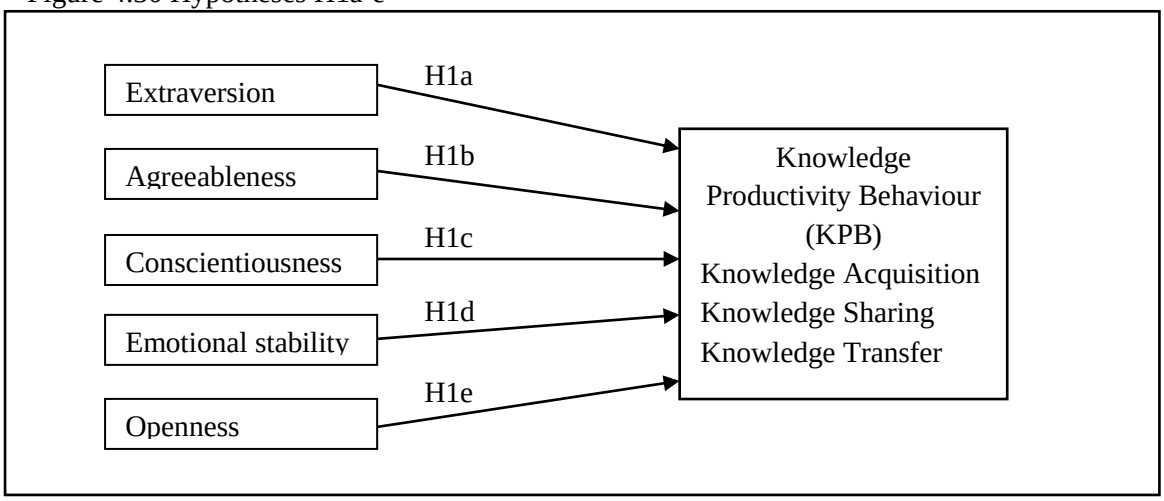
CHAPTER 4: TIME 1 SCIENCE TECHNOLOGY ANALYSIS

4.30 Science Technology Sample, Tests of Hypotheses H1a-e: Relationships of Big Five to KPB Variables

This section describes the Science Technology sample results from testing structural equation models of the effects of the Big Five personality traits of Extraversion, Agreeableness, Conscientiousness, Emotional Stability, and Openness on Knowledge Productivity Behaviour (KPB). Thus, results from these models address Hypotheses H1a-e, which proposed that Openness, Emotional Stability and Conscientiousness has a positive relationships with KPB and Agreeableness may have both positive and negative relationships with KPB, resulting of an overall null association with KPB.

Two sets of models were estimated and reported in this section: (a) a set of models with a single, higher order KPB construct, and (b) a set of models in which the three KPB elements of knowledge acquisition, knowledge sharing and knowledge transfer were treated as separate latent constructs. In all of these models, the Big Five variables were treated as a set of simultaneous predictors, and either the higher order KPB variable, or the set of three KPB component variables were treated as outcome variables, as shown in illustrative Figure 5. The models in which there was a single, higher order KPB variable test for effects of the Big Five on Knowledge Productivity Behaviours in general; the models with each of the three KPB components modeled separately allow one to see whether there are any differences in relationships depending upon the specific category of KPBs.

Figure 4.30 Hypotheses H1a-e



4.31.1 Effects of the Big Five on the Higher Order KPB Construct

Three models were estimated looking at the direct effects of the Big Five personality variables on the higher order KPB construct. Table 4.31.1.1 reports the overall model fit for each of these three models, and Table 4.31.1.2 reports the estimated path coefficients for the models. As can be seen in Table 4.31.1.1, although the chi-square goodness-of-fit statistics were statistically significant for all three models, the other indices of fit suggested that all three models fit acceptably well. The following paragraphs describe specifics of the models and the implications of the estimated path coefficients in each of these models.

4.31.2 Big Five Effects on Higher Order KPB Construct: Overall model fit and path coefficients

The specification of Model 1 included paths from latent constructs representing each of the Big Five variables to the higher order KPB construct. In addition, the Big Five variables were all allowed to freely inter-correlate with each other. As can be seen in Table 4.31.1.1, the chi-square goodness of fit statistic of $X^2_{(255)}$ =453.615 was significant, other fit indices suggested Model 1 was close to fitting adequately. The results presented in the top portion of Table 4.31.1.2 indicate that all of the five personality variables had significant path coefficients when effects of all five personality variables were included in the model with *p*-value range from .11 to .40. In contrast with Model 1 in the Social Science sample, all personality variables appeared to have statistically significant effects. Overall, Model 1 explained about 56% of the variance in the higher order KPB construct. However, a closer inspection of the standardized regression coefficients showed that one of them (for Emotional Stability) had a value greater than one, which suggested that multicollinearity issues might be present. To investigate this possibility and if necessary avoid the potential for artefactual results, a couple of additional trimmed models were estimated.

In Model 2, the effects of four predictors were chosen to be tested (i.e., Extraversion, Agreeableness, Openness and Conscientiousness), the Emotional Stability effect on KPB was dropped because it showed a different sign than would be anticipated from the measurement model results, and thus might be a source of spurious findings. Model 2 also had a statistically significant chi-square statistic, as shown in Table 4.31.2, however, again the RMSEA, CFI and SRMR values suggested that it fit the data essentially as well as did Model 1. In Model 2, one trait had statistically significant predictive path to the higher order KPB construct; Openness (β= .622, p=.027) remained statistically significant and Extraversion (β=

.369, p=.064) marginally significant. The remaining effects of personality traits show non-significant path coefficients. Overall in Model 2 show drop of variance about 6% than in Model 1.

Finally, after couple of trimmed out based on previous model, in Model 3 shows Openness had statistically significant effect as a strong predictor of the higher order KPB. This model had a statistically significant chi-square for the test of overall model fit (as did the previous two models), indicating a significant degree of misfit in the model. In Model 3, with the strongest path of Openness *p*=<.001, and leaving the remaining traits non-significant. Overall in Model 3 implies that only one predictor are needed to adequately capture all of the Big Five effects and explained dropped of 26% of variance than in Model 2.

Table 4.31.1.1 Model Fit Statistics for Tests of H1a-H1e using the Higher Order KPB Construct

Model	X^2	df	ρ	RMSEA (90% CI)	CFI	SRMR
1	453.615	255	<.001	.057 (.049, .066)	.924	.060
2	462.989	256	<.001	.059 (.050, .067)	.920	.060
3	477.758	259	<.001	.060 (.051, .068)	.916	.067

Note. *N* = 236. RMSEA = Root Mean Square Error of Approximation; CFI = Comparative Fit Index; SRMR = Standardized Root Mean Square Residual.

Table 4.31.1.2 Tests of H1a-H1e: Path coefficients for relationships of Big Five to higher order KPB factor

	Unstandardized Coefficients			*Standardized Coefficients*
Model	***B***	***se***	***ρ***	***β***
Model 1: Predicting KPB from all Big 5 Predictors				
Extraversion	.569	.238	.017	.453
Agreeableness	-.954	.401	.017	-.845
Conscientiousness	1.134	.446	.011	.723
Emotional stability	-.254	.124	.040	-.312
Openness	.517	.208	.013	.518
R^2 = .560				
Model 2: Prediction from Extraversion, Agreeableness, Conscientiousness And Openness				
Extraversion	.461	.249	.064	.369
Agreeableness	-.884	.589	.134	-.806

Conscientiousness	.678	.465	.145	.438
Emotional stability	-	-	-	-
Openness	.625	.282	.027	.622
R^2 = 501				
Model 3: Prediction from Openness				
Extraversion	-	-	-	-
Agreeableness	-	-	-	-
Conscientiousness	-	-	-	-
Emotional stability	-	-	-	-
Openness	.497	.094	<.001	.497
R^2 = .247				

4. 32 Effects of the Big Five on the KPB Components (KA, KS, KT)

In this next set of models, the Big Five variables were specified as predictors of the three separate lower-order KPB components, rather than combining the KPB components into a single higher order construct as was done for the previous set of analyses. This meant that there were three potential outcomes of the Big Five effects, namely, Knowledge Acquisition (KA), Knowledge Sharing (KS) and Knowledge Transfer (KT). Again, an initial model consistent with testing Hypotheses 1a-e was specified in Model 2.

4. 32.1 Big Five Effects on KA, KS, and KT: Overall model fit and path coefficients

In the next set of models, the Big Five variables were specified as predictors of all three KPB components. Model 4 show the overall significant effects of the personality traits with three elements of KPB; KA (Knowledge Acquisition), KS (Knowledge Sharing) and KT (Knowledge Transfer). Model 4 includes all five of the personality predictors for each of the three outcome variables.

Model 4 included paths from each of the Big Five variables to each of the three KPB lower order constructs. As can be seen in Table 4.32.1.1, the chi-square goodness of fit statistic of $X^2_{(245)}$ =447.823 was significant, however, other fit indices suggested Model 4 was close to fitting adequately. The results presented in the top portion of Table 4.32.1.2 shows the significant path coefficients for each of the KPB lower order constructs when effects of all five personality variables were included in the model. More specifically, in Model 4 majority of the traits addressed significantly predicted KA: Extraversion, β= .461, p= .014; Agreeableness, β= -.795, p= .019, Conscientiousness β= .667, p= .025, and Openness β= .484, p= .026, except for Emotional Stability shows non-significant path coefficients. For KS, all of the traits shows strong significant results of Extraversion, β= .342, p= .039,

Agreeableness, β= -.622, p= .037, Conscientiousness β= .606, p= .012, Emotional Stability β= -.313, p= .016 and Openness β= .410, p= .018. For KT, similar results with KA again majority of the traits addressed significantly predicted KT: Extraversion, β= .375, p= .018; Agreeableness, β= -.812, p= .021, Conscientiousness β= .601, p= .029, and Openness β= .447, p= .035, except for Emotional Stability shows non-significant path coefficients.

The previous Models 1, which had a higher order KPB construct, explained around 56% of the variance in KPB. Looking at explained variance in the three separate KPB components of Model 4 suggests that, when looking at KA and KS, the set of Big Five predictors explained slightly less, but close to the same amount of variance. Specifically, for KA, R^2 = .517, for KS, R^2 = .336, and for KT, R^2 = .392. Again, Model 4 is acceptable as it implies that no trimmed are needed as all the predictors are needed to adequately capture all of the Big Five effects for the higher order KPB constructs.

Since the Big Five variables correlated amongst themselves to some extent, it was possible that there was enough shared variance to hide otherwise significant effects. To investigate this, a couple of trimmed models were estimated as was done previously for the higher order KPB models.

In Model 5, several paths from the Big Five to separate KPB constructs that were not statistically significant model were trimmed. Model 5 also had a statistically significant chi-square statistic, as shown in Table 4.32.1.1. As results, two effects of shows Extraversion and Openness statistically significant for KA, and only Openness with a p value ranging from .004 to .002 had significant effects on KS and KT and leaving the remaining traits not statistically significant for all KPB constructs (for specific values please refers to Table 4.32.1.1).

Finally, in Model 6 this model had a statistically significant chi-square for the test of overall model fit (as did the previous two models), other fit indices suggested Model 6 was close to fitting adequately. Again, in order to get more significant effects, Model 6 demonstrates effects of Openness trait. The outcomes resulting very strong effects as all p-values of Openness are p =<.001 and leaving the remaining traits statistically non significant. Overall in Model 6 implies that only one predictor Openness are needed to adequately capture all of the Big Five effects for KPB constructs.

Table 4.32.1.1 Overall model fit for tests of H1a-e

Model	x^2	df	ρ	RMSEA (90% CI)	CFI	SRMR
4	447.823	245	<.001	059 (.050, .068)	.922	.060
5	465.104	250	<.001	060 (.052, .069)	.917	.065
6	477.674	257	<.001	060 (.052, .069)	.915	.068

Note. N = 236. RMSEA = Root Mean Square Error of Approximation; CFI = Comparative Fit Index; SRMR = Standardized Root Mean Square Residual.

Table 4.32.1.2 Path coefficients from models of relationships of Big Five to higher order KA, KS and KT

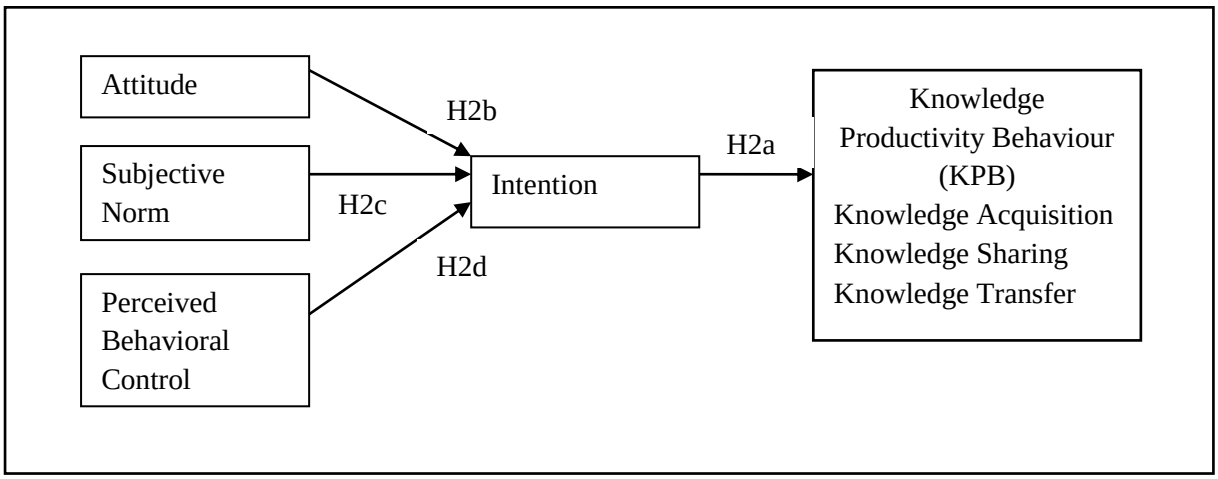
	Unstandardized Coefficients			*Standardized Coefficients*
Model	***B***	***se***	***ρ***	***β***
Model 4: Predicting KPB from all Big 5 Predictors with KPB construct				
Outcome = KA				
Extraversion	.630	.257	.014	.461
Agreeableness	-.993	.424	.019	-.795
Conscientiousness	1.150	.511	.025	.667
Emotional stability	-.247	.149	.097	-.276
Openness	.529	.238	.026	.484
R^2 = .517				
Outcome = KS				
Extraversion	.571	.277	.039	.342
Agreeableness	-.948	.455	.037	-.622
Conscientiousness	1.276	.509	.012	.606
Emotional stability	-.343	.142	.016	-.313
Openness	.547	.232	.018	.410
R^2 = .336				
Outcome on KT				
Extraversion	.428	.181	.018	.375
Agreeableness	-.846	.365	.021	-.812
Conscientiousness	.863	.395	.029	.601
Emotional stability	-.147	.098	.133	-.197
Openness	.408	.193	.035	.447
R^2 = .392				
Model 5 KA				
KA: Prediction from Extraversion, Agreeableness and Openness				
Extraversion	.351	.170	.039	.259
Agreeableness	-.248	.210	.239	-.202
Conscientiousness	-	-	-	-
Emotional stability	-	-	-	-

Openness	.540	.179	.002	.493
R^2 = .292				
KS: Prediction from Extraversion Conscientiousness, Emotional Stability and Openness				
Extraversion	.272	.181	.132	.165
Agreeableness	-	-	-	-
Conscientiousness	.089	.264	.735	.042
Emotional stability	-.124	.076	.105	-.113
Openness	.451	.175	.010	.338
R^2 = .195				
KT: Prediction from Model Extraversion, Agreeableness and Openness				
Extraversion	.228	.127	.073	.203
Agreeableness	-.268	.159	.092	-.264
Conscientiousness	-	-	-	-
Emotional stability	-	-	-	-
Openness	.417	.144	.004	.459
R^2 = .193				
Model 6				
KA: Prediction from Openness				
Extraversion	-	-	-	-
Agreeableness	-	-	-	-
Conscientiousness	-	-	-	-
Emotional stability	-	-	-	-
Openness	.542	.105	<.001	.489
R^2 = .239				
KS: Prediction from Openness				
Extraversion	-	-	-	-
Agreeableness	-	-	-	-
Conscientiousness	-	-	-	-
Emotional stability	-	-	-	-
Openness	.559	.106	<.001	.420
R^2 = .176				
KT: Prediction from Openness				
Extraversion	-	-	-	-
Agreeableness	-	-	-	-
Conscientiousness	-	-	-	-
Emotional stability	-	-	-	-
Openness	.338	.067	<.001	.371
R^2 = .138				

4.33 Science Technology Sample, Tests of Hypotheses H2a-e: Relationships of Theory of Planned Behaviour (TPB) to KPB Variables

This section describes the results from testing structural equation models of the effects of the Theory of Planned Behaviour (TPB) on the higher order KPB (Knowledge Productivity Behaviour) construct, as well as the three KPB elements, i.e., knowledge acquisition, knowledge sharing and knowledge transfer. In all of these models, the Theory of Planned Behaviour variables were treated as predictor variables, and the outcome were higher order KPB variables as shown in illustrative Figure 6. As well as testing the hypothesis within each of the different sets of predictors, the results from these models address Hypotheses H2a-d, which proposed that Intention, has positive direct relationships with KPB and the effects of Attitude, Subjective norms and PBC has mediating effects on KPB via Intentions.

Figure 4.33 Hypotheses H2a-e



4.33.1 Effects of the Theory of Planned Behaviour (TPB) on the Higher Order KPB Construct

Two models were estimated looking at the direct effects of the Theory of Planned Behaviour (TPB) on the higher order KPB construct. The first model is totally consistent with the pattern of hypothesised relationships, the remaining model uses information from the first estimation to trim non-significant paths from the original model. Table 4.33.1.1 reports overall model fit for each of these two models, and Table 4.33.1.2 reports the estimated path coefficients for the models. As can be seen in Table 4.33.1.1, although the chi-square goodness of fit statistics was significant, other indices of fit suggested that all two models had an acceptable level of fit. The following paragraphs describe specifics of the models and the implications of the estimated path coefficients in each of these models.

4.33.2 Structural Models of Theory of Planned Behaviour (TPB): Overall model fit and path coefficients

This next section describes models specified to test Hypotheses H2a-d, proposing relationships of the TPB variables with Knowledge Productivity Behaviour. All of the models in this section used a higher order KPB construct as the outcome variable.

Model 1.1 included paths from each of the behavioural component to the higher order of each KPB variable. As can be seen in Table 4.33.1.1, the chi-square goodness of fit statistic of $X^2_{(198)}$ =416.472 was significant, other fit indices suggested Model 1.1 was close to fitting adequately. The results presented in the top portion of Table 4.33.1.2 shows the behavioural component variables significant path coefficients when effects of all behavioural component variables were included in the model. The results presented in the top portion of Table 4.33.1.2 indicate that both of Model 1.1 and Model 2.2 Intention components had significant path coefficients with KPB with 31% variance remained the same. Table 4.33.1.2 indicate that only one behavioural component (Subjective Norm with values of β= .006, p= .962) had none significant path coefficients when effects of all two variables were included in the model. The remaining two; Attitude and PBC shows strong significant effects on Intention which has a value of p= <.001. Overall, Model 1.1 explained a total of about 59% of the variance in the on Intention. Because the Theory of Planned Behaviour variables correlated amongst themselves to some extent, it was possible that there was enough shared variance to hide otherwise significant effects. To investigate this, a couple of trimmed models were estimated.

Model 2.2 was identical to Model 1.2, except it fixed the path from Subjective Norm to the KPB construct to zero. (The Subjective Norm effect was chosen to be removed since it was not statistically significant and had the highest p-value in the previous model.) Model 2.2 also had a statistically significant chi-square statistic, as shown in Table 4.33.1.1, the RMSEA, CFI and SRMR values suggested that it fit the data as in Model 1. Again, in Model 2.2, the effect of Attitude and PBC shows strong significant path coefficients on Intention. Overall, Model 2.2 shows similar 59% of the variance in Intention.

Table 4.33.1.1 Overall model fit for tests of H2a-H2e

Model	x^2	df	ρ	RMSEA (90% CI)	CFI	SRMR
1.1	416.472	198	<.001	.068 (.059, .078)	.938	.071
2.2	416.476	199	<.001	.068 (.059, .077)	.938	.071

Note. *N* = 236. RMSEA = Root Mean Square Error of Approximation; CFI = Comparative Fit Index; SRMR = Standardized Root Mean Square Residual.

Table 4.33.1.2 Path coefficient from models of relationships of TPB to higher order KPB factor

	Unstandardized Coefficient			*Standardized Coefficient*
Model	***B***	***se***	***ρ***	***β***
Model 1.1: All TPB Predictors				
KPB on				
Intention	.309	.044	<.001	.559
R^2 = .312				
Intention on				
Attitude	.517	.171	.002	.348
Subjective norm	.009	.180	.962	.006
PBC	.506	.119	<.001	.523
R^2 = .598				
Model 2.2: Dropping Subjective Norm				
KPB on				
Intention	.309	.044	<.001	.559
R^2 = .312				
Intention on				
Attitude	.522	.129	<.001	.351
Subjective norm	-	-	-	-
PBC	.508	.105	<.001	.525
R^2 = .599				

4.34 Science Technology Sample, Effects of the Theory of Planned Behaviour (TPB) on the KPB Components (KA, KS, KT)

In the next set of models, the Theory of Planned Behaviour variables were specified as predictors of all three KPB components. Model 3.3 and 4.4 shows the overall significant effects of the behavioural component with three elements of KPB; KA (Knowledge Acquisition), KS (Knowledge Sharing) and KT (Knowledge Transfer).

4.34.1 Structural Models of Theory of Planned Behaviour (TPB) on the KPB Components (KA, KS, KT): Overall model fit and path coefficients

In the next set of models, the Theory of Planned Behaviour variables were specified as predictors of all three KPB components. Model 3.3 and 4.4 show the overall significant effects of the behavioural component with three elements of KPB; KA (Knowledge Acquisition), KS (Knowledge Sharing) and KT (Knowledge Transfer). Model 3.3 includes all behavioural component predictors for each of the three outcome variables. The remaining models investigate the effects of trimming some of the non-significant paths from the full model (i.e., Model 4.4).

Table 4.34.1.2 shows the overall significant all four behavioural effects with three elements of KPB; KA (Knowledge Acquisition), KS (Knowledge Sharing) and KT (Knowledge Transfer) were included in the model. Model 3.3 included paths from each of the behavioural component to the higher order of each KPB variable. As can be seen in Table 4.34.1.1, the chi-square goodness of fit statistic of $X^2_{(196)}$ =414.961 was significant, other fit indices suggested Model 3.3 was close to fitting adequately. The results presented in the top portion of Table 4.34.3 shows the behavioural component variables significant path coefficients when effects of all behavioural component variables were included in the model. The results presented in the top portion of Table 4.34.1.2 indicate that both of Model 3.3 and Model 4.4 Intention components had significant path coefficients with KPB with variance remained the same for both model for each of KPB elements. Table 4.34.1.2, again indicate that only one behavioural component (Subjective Norm with values of β= .006, p= .965) had none significant path coefficients when effects when all two variables were included in the model. The remaining two; Attitude and PBC shows strong significant effects on Intention which has a value of p= <.001. Overall, Model 3.3 explained a total of about 59% of the variance on Intention. Because the Theory of Planned Behaviour variables correlated amongst themselves to some extent, it was possible that there was enough shared variance to hide otherwise significant effects. To investigate this, a couple of trimmed models were estimated.

In order to trim out a non-significant effect, Model 4.4 fixed the path from Subjective Norm to the KPB construct to zero. Model 4.4 also had a statistically significant chi-square statistic, as shown in Table 4.34.1.1, the RMSEA, CFI and SRMR values suggested that it fit the data as in Model 3.3. As a result, again in Model 4.4, the effect of Attitude and PBC shows strong

significant path coefficients on Intention. Overall, Model 4.4 explains a similar proportion (21%) of the variance in Intention, and also in KA (.21), KS (.24) and KT (.22).

Table 4.34.1.1 Overall model fit for tests of H2a-H2e

Model	x^2	df	ρ	RMSEA (90% CI)	CFI	SRMR
3.3	414.961	196	<.001	.069 (.060, .078)	.938	.069
4.4	414.965	197	<.001	.068 (.059, .078)	.938	.069

Note. *N* = 236. RMSEA = Root Mean Square Error of Approximation; CFI = Comparative Fit Index; SRMR = Standardized Root Mean Square Residual.

Table 4.34.1.2 Path coefficient from models of relationships of TPB to higher order KPB factor

	Unstandardized Coefficient			*Standardized Coefficient*
	B	**se**	ρ	β
Model 3.3: Predicting KPB from all TPB Predictors				
KA on				
Intention	.287	.053	<.001	.460
R^2 = .212				
KS on				
Intention	.369	.048	<.001	.492
R^2 = .242				
KT on				
Intention	.239	.033	<.001	.465
R^2 = .216				
Intention on				
Attitude	.516	.171	.003	.347
Subjective norm	.008	.180	.965	.006
PBC	.508	.119	<.001	.524
R^2 = .599				
Model 4.4: Dropping Subjective Norm				
KA on				
Intention	.287	.053	<.001	.460
R^2 = .212				
KS on				
Intention	.369	.048	<.001	.492
R^2 = .242				
KT on				
Intention	.239	.033	<.001	.465
R^2 = .216				
Intention on				
Attitude	.521	.129	<.001	.350
Subjective norm	-	-	-	-
PBC	.510	.105	<.001	.526
R^2 = .599				

4.35 Science Technology Sample, Tests of the Mediating Role of Intention in the Relationships of Attitude, Subjective Norm and Perceived Behavioural Control with KPB

Prior towards above model, this section describes the results from testing of the mediating effects of Intention in the Relationships of Attitude, Subjective Norm and Perceived Behavioural Control with KPB as well as the three KPB constructs, i.e., knowledge acquisition, knowledge sharing and knowledge transfer as shown in illustrative Figure 2. Thus, results from these models address Hypotheses H2a-d, which proposed Attitude, Subjective norms and PBC has mediating effects on KPB via Intentions.

4.35.1 Effects of mediating role of Intention in Attitude, Subjective Norm and Perceived Behavioural Control with KPB

A total of three hypotheses were estimated looking at the mediating effects of Intention in the Relationships of Attitude, Subjective Norm and Perceived Behavioural Control with KPB. The first results presented in Table 4.35.1.1 shows the mediating effect of Intention when effects of all behavioural component variables were included in the model. The results presented in the table shows similar results reported in Social Science sample. More specifically, in Science Technology sample all Sub-model H2a-d (i) indicate Intention components had significant effects in Attitude and PBC with KPB with value of p= <.001, leaving only one behavioural component Subjective Norm had none significant effects with p values of .950. Subsequently, the second results presented Sub-model H2a-d (ii) dropped Subjective Norm, reported that remaining Attitude and PBC remained strongly statistically significant effects.

Table 4.35.1.1 Effects of mediating role of Intention in Attitude, Subjective Norm and Perceived Behavioural Control with KPB

	Unstandardized Coefficient			***Standardized Coefficient***
Effects of Intention mediating role	***B***	***se***	***ρ***	***β***
Sub-model H2a- d (i)				
KPB				
Attitude to KPB via intention	.160	.046	<.001	.194
Norm to KPB via intention	.003	.042	.950	.003
PBC to KPB via intention	.156	.033	<.001	.292
Sub-model H2a- d (ii): Dropping Subjective Norm				
KPB				
Dropping Subjective Norm				
Attitude to KPB via intention	.161	.038	<.001	.196
PBC to KPB via intention	.157	.031	<.001	.293

4.36 Science Technology Sample, Tests of the Mediating Role of Intention in the Relationships of Attitude, Subjective Norm and Perceived Behavioural Control with KPB constructs (KA, KS, KT)

Prior towards above model, this section describes the results from testing of the mediating effects of Intention in the Relationships of Attitude, Subjective Norm and Perceived Behavioural Control with three KPB constructs, i.e., knowledge acquisition, knowledge sharing and knowledge transfer as shown in illustrative Figure 4.33. Thus, results from these models address Hypotheses H2a-d, which proposed Attitude, Subjective norms and PBC has mediating effects on KPB Constructs; KA, KS and KT via Intentions.

4.36.1 Effects of mediating role Effects of mediating role of Intention in Attitude, Subjective Norm and Perceived Behavioural Control with KPB

A total of three hypotheses were estimated looking at the mediating effects of Intention in the Relationships of Attitude, Subjective Norm and Perceived Behavioural Control with KPB constructs (KA, KS, and KT). The results presented in Table 4.36.1.1 shows the mediating effect of Intention when effects of all behavioural component variables were included in the model. The results presented in the table shows that all Sub-model H2a-d (i) indicate Intention components had significant effects in Attitude and PBC with KA, KS and KT with value of p= <.001, leaving only one behavioural component Subjective Norm had none significant effects with values less than .965. Subsequently, Sub-model H2a-d (ii) dropped Subjective Norm, reported that again Attitude and PBC remained strongly statistically significant effects for all KA, KS and KT.

Table 4.36.1.1 Effects of mediating role of Intention in Attitude, Subjective Norm and Perceived Behavioural Control with KA, KS and KT

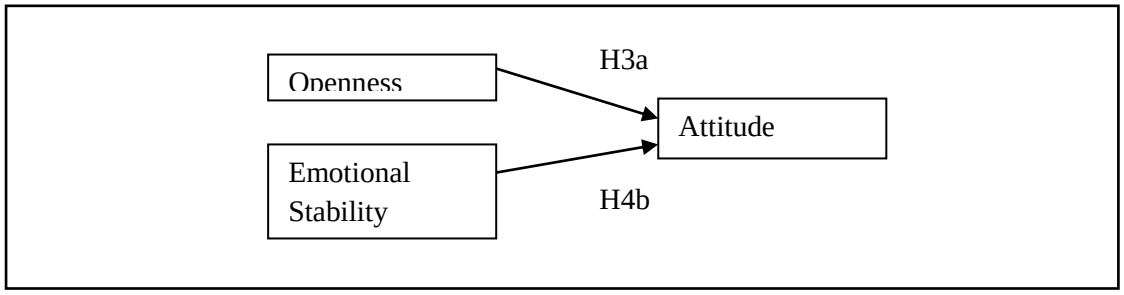
	Unstandardized Coefficient			***Standardized Coefficient***
Effects of Intention mediating role	***B***	***se***	***ρ***	***β***
Submodel H2a- d (i)				
KA				
Attitude to KA via intention	.148	.046	<.001	.160
Norm to KA via intention	.002	.039	.954	.003
PBC to KA via intention	.146	.034	<.001	.241
KS				
Attitude to KS via intention	.191	.054	<.001	.171
Norm to KS via intention	.003	.050	.954	.003
PBC to KS via intention	.187	.038	<.001	.258

KT				
Attitude to KT via intention	.123	.035	<.001	.161
Norm to KT via intention	.002	.033	.965	.003
PBC to KT via intention	.121	.025	<.001	.244
Sub-model H2a- d (ii): Dropping Subjective Norm				
KA				
Dropping Subjective Norm				
Attitude to KA via intention	.150	.039	<.001	.161
PBC to KA via intention	.146	.032	<.001	.242
KS				
Dropping Subjective Norm				
Attitude to KS via intention	.192	.045	<.001	.172
PBC to KS via intention	.188	.036	<.001	.259
KT				
Dropping Subjective Norm				
Attitude to KT via intention	.124	.029	<.001	.163
PBC to KT via intention	.122	.024	<.001	.245

4.37 Science Technology Sample, Tests of Hypotheses H3a and H3b: Relationships of Openness and Emotional Stability traits on Attitude

This section describes the results from testing structural equation models of the effects of the Big Five personality traits (Openness and Emotional Stability) on Attitude as shown in illustrative Figure 7. Thus, results from these sub-models address Hypotheses H3a-b, which proposed that Openness and Emotional Stability has positive direct relationships Attitude.

Figure 4.37 Hypotheses H3a-b



4.37.1 Hypothesis H3a and H3b, Effects of the Emotional Stability traits and Openness on Attitude

A sub-model was estimated to specifically investigate the effects of the Big Five variables of Openness and Emotional Stability on Attitude, as proposed in Hypotheses H3a-b. Table 4.37.1.1 reports overall model fit for each of this model, and Table 4.37.1.2 reports the estimated path coefficients for the model. As can be seen in Table 4.37.1.1, although the chi-

square goodness of fit statistics was significant, other indices of fit suggested that the models had an acceptable level of fit. The following paragraphs describe specifics of the model and the implications of the estimated path coefficients in this model.

This next section describes sub-models specified to test Hypotheses H3a and H3b for their direct effects, proposing relationships of the Big Five Emotional Stability and Openness traits on and TPB variable of Attitude.

Sub-model H3a-b shows the overall significant effects of the two personality traits on Attitude. As can be seen in Table 4.37.1.1, the chi-square goodness of fit statistic of $X^2_{(24)}$ = 32.471 was significant, other fit indices suggested Model H3a-b was close to fitting adequately. The results presented in the top portion of Table 4.37.1.2 indicate that only one variable had significant path coefficients on Attitude. More specifically, in this model only Openness were statistically significant effects for Attitude, with values of β= .341, p= <.001. Overall, H3a-b explained a total of about 114% of the variance.

Table 4.37.1.1 Overall model fit for tests of H3a-b

Hypo	x^2	df	ρ	RMSEA (90% CI)	CFI	SRMR
H3a-H3b	32.471	24	<.001	.039 (.000, .070)	.988	.038

Note. *N* = 236. RMSEA = Root Mean Square Error of Approximation; CFI = Comparative Fit Index; SRMR = Standardized Root Mean Square Residual.

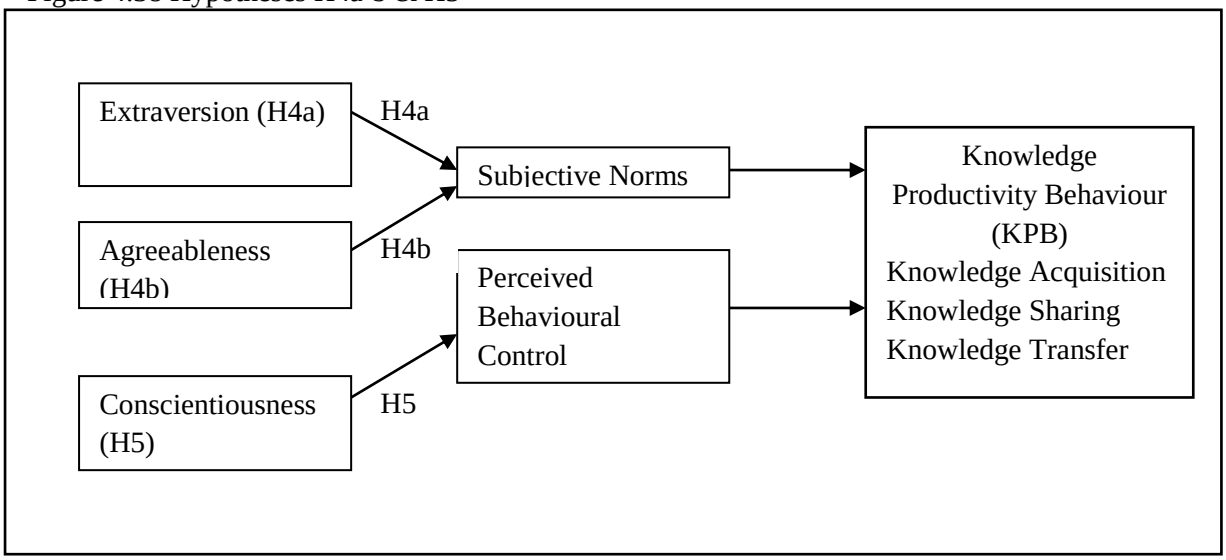
Table 4.37.1.2 Relationships of Emotional Stability traits and Openness on Attitude

	Unstandardized Coefficient			***Standardized Coefficient***
Model	***B***	***se***	***ρ***	***β***
Model H3a-b: Relationship of Emotional Stability traits and Openness on Attitude				
Attitude on				
Emotional Stability	-.009	.079	.908	-.010
Openness	.394	.116	<.001	.341
R^2 = .114				

4.38 Science Technology Sample, Tests of Hypotheses H4a-b and H5: Interactions of Traits and Behaviour on Intention

This section describes the results from testing structural equation models of the interaction effects of selected Big Five personality traits (Extraversion, Agreeableness and Conscientiousness) with the TPB variables of Subjective Norms and Perceived Behavioural Control on Intention, as shown in illustrative Figure 8. Thus, results from these models address Hypotheses H4a-b, which proposed that the relationship of subjective norms with intentions to engage in academic productivity behaviours is positively moderated by Extraversion (H4a) and Agreeableness (H4b) and the relationship of PBC with intentions to engage in KPB is positively moderated by Conscientiousness (H5).

Figure 4.38 Hypotheses H4a-b & H5



4.38.1 Interactions of Traits and Behaviour on Intention

A model was estimated looking at the interactions of the Big Five and TPB variables on Intention. Table 4.38.1.1 reports overall model fit for each of this model, and Table 4.38.1.2 reports the estimated path coefficients for the model. As can be seen in Table 4.38.1.1, although only two (H4b and H5) of the chi-square goodness of fit statistics was significant, other indices of fit suggested that the models had an acceptable level of fit. The following paragraphs describe specifics of the model and the implications of the estimated path coefficients in this model.

In this set of sub-model, Big Five and TPB variables on Intention were estimated for their interactions effects. Model H4a-b and H5 shows the overall significant effects of the Big Five personality traits, TPB and their interaction on Intention.

In Model H4a as can be seen in Table 4.38.1.1, has the reading of less of $X^2_{(42)}$ = 35.421 resulting hypothesis were not supported with the p- values of H4a (p= 0.753). Model H4a included path from Extraversion, Norm and interactions from NormxExtraversion on Intention. The results indicate that Norm with a value of β= .773, p= <.001 and Extraversion with a value of β= .419, p= .007 had significant path coefficients on Intention and leaving interactions from and NormxExtraversion with a value of β= -.100, p= .674 on Intention non-significant. Overall, H4a explained a total of about 37% of the variance.

In Model H4b as can be seen in Table 4.38.1.1, has the reading of less of $X^2_{(42)}$ = 35.217 resulting hypothesis were supported with the p- values of H4b (p= 0.761). Model H4b included path from Agreeableness, Norm and interactions from NormxExtraversion on Intention. The results indicate two variable had significant path coefficients on Intention, effect for Norm with a value of β= .742, p= <.001 and Agreeableness value of β= .543, p= .045 (were not far from significant) and leaving remaining NormxExtraversion value of β= -.257, p= .312 on Intention non-significant. Overall, H4b explained a total of about 37% of the variance.

In Model H5 as can be seen in Table 4.38.1.1, although the chi-square goodness of fit statistic of $X^2_{(42)}$ =58.858, p = 0.004 was significant, other fit indices suggested Model H5 was adequate fit model. Overall these results provide support for hypotheses testing of Model H5. Model H5 included path from Conscientiousness, PBC interactions from PBCxConscientiousness on Intention. The results presented in the top portion of Table 4.38.1.2 indicate two variable had significant path coefficients on Intention. More specifically, in this model there were statistically significant effect for PBC, with values of β= .659, p= <.001, Conscientiousness, with values of β= .144, p= .045 and PBCxConscientiousness with values of β= .084, p= .608. Conscientiousness and PBCxConscientiousness had non-significant interactions on Intention. Overall, H5 explained a total of about 51% of the variance.

Table 4.38.1.1 Overall model fit for tests of H4a-b and H5

Hypo	x^2	df	ρ	RMSEA (90% CI)	CFI	SRMR
H4a	35.421	42	.753	000 (.000, .032)	1.000	.035
H4b	35.217	42	.761	000 (.000, .032)	1.000	.034
H5	58.858	42	.004	041 (.007, .064)	.981	.049

Note. *N* = 236. RMSEA = Root Mean Square Error of Approximation; CFI = Comparative Fit Index; SRMR = Standardized Root Mean Square Residual.

Table 4.38.1.2 Interactions of Big Five and TPB on Intention

	Unstandardized Coefficients			*Standardized Coefficients*
Hypothesis	***B***	***se***	***ρ***	***β***
Hypothesis H4a: Interactions of Extraversion with Norm and Intentions				
Intention on				
Norm	.773	.141	<.001	.551
Extraversion	.419	.154	.007	.189
NormxEx	-.100	.237	.674	-.037
R^2 = .374				
Hypothesis H4b: Interactions of Agreeableness with Norm and Intentions				
Intention on				
Norm	.742	.156	<.001	.526
Agreeableness	.543	.271	.045	.206
NormxAgree	-.257	.254	.312	-.096
R^2 = .375				
Hypothesis H5: Interactions of Conscientiousness with PBC and Intentions				
Intention on				
PBC	.639	.094	<.001	.659
Conscientiousness	.356	.178	.045	.144
PBCxCons	.144	.280	.608	.084
R^2 = .516				

4.39 Summary of Results

Table 4.39.1 shows the summary of hypotheses H1a-e and H2a-d testing based on the estimation of Science Technology sample. Information in the table below indicating that when all the Big Five variables were specified as predictors of KPB, only two hypotheses were supported significantly predicted KPB which are h1c and h1e. Hypothesis of H2a-d testing of direct effects of the Theory of Planned Behaviour (TPB) to higher order KPB evidence that in this model only h2c hypotheses are not supported. The outcome indicate that attitude and PBC significantly predicted behavioural intentions and behavioural intentions significantly predicted knowledge productivity behaviours and its elements; KA, KS and KT.

Next Table 4.39.2 shows results hypothesis H2b-d testing of mediating effects of the Theory of Planned Behaviour (TPB) to higher order KPB. Results reported that all hypotheses except H2c were supported in this sub-model, behavioural intentions significantly have a mediated effect on KPB, and attitude and PBC have mediated effect on Behavioural Intentions. However, again for both study Subjective Norms did not have mediated effects on behavioural intentions for KPB.

Finally, table 4.39.3 shows results of Hypotheses H3-H5, the results are identical with the previous Social Science sample. The results from testing effects of the Big Five personality traits (Openness and Emotional Stability) on Attitude indicated that only H3a were supported and Emotional stability do not significantly predicting Attitude towards publishing/presenting. Hypotheses H4a-b and H5 testing the interactions of the Big Five and TPB variables on Intention, is positively moderated by; Extraversion (H4a), Agreeableness (H4b) and the relationship of PBC with intentions to engage in KPB is positively moderated by Conscientiousness (H5) all the hypotheses reported were not supported. For further information please refer to Appendix 6.

Table 4.39.1: Summary of Hypothesis Testing regarding effects of KPB

	Statement of hypotheses H1a-e (B5)	Standardized effect	Results indicate for higher order KPB
H1a	*Openness has a positive relationship with Knowledge Productivity Behaviour.*	.497	Supported
H1b	*Emotional stability has a positive relationship with Knowledge Productivity Behaviour.*	---	Not supported
H1c	*Extraversion has a positive relationship with Knowledge Productivity Behaviour.*	---	Not supported
H1d	*Agreeableness may have either positive or negative relationships with Knowledge Productivity Behaviour.*	---	Not supported
H1e	*Conscientiousness has a positive relationship with Knowledge Productivity Behaviour.*	---	Not supported
	Statement of hypotheses H2a-d (TPB)	**Standardized effect**	**Results indicate for higher order KPB**
H2a	*Intention to engage in research activities has a direct, positive effect on Knowledge Productivity Behaviour.*	.559	Supported
H2b	*Attitude towards publishing/presenting has a positive, direct effect on behavioural intention*	.351	Supported
H2c	*Subjective Norms about academic productivity pressure (i.e., peer and superior) have a positive direct effect on behavioural intention.*	---	Not supported
H2d	*Perceived Behavioural Control towards capabilities in publishing has positive direct effects on behavioural intention.*	.525	Supported

Table 4.39.2 Summary of mediating effects of TPB variables and KPB

	Statement of hypotheses H2b-d (mediating effects)	Standardized effect	Results
H2b	*Attitude towards publishing/presenting has a mediated effect on Knowledge Productivity Behaviour via behavioural intention.*	.196	Supported
H2c	*Subjective Norms about academic productivity pressure (i.e., peer and superior) have a mediated effect on Knowledge Productivity Behaviour via behavioural intention.*	---	Not supported
H2d	*Perceived Behavioural Control towards capabilities in publishing have a mediated effect on Knowledge Productivity Behaviour via behavioural intention.*	.293	Supported

Table 4.39.3 Summary of direct and indirect effects of Big Five and TPB variables

	Statement of hypotheses H3-H5	Standardized effect	Results
H3a	*Openness is positively related to Attitude towards publishing/presenting.*	.341	Supported
H3b	*Emotional stability is positively related to Attitude towards publishing/presenting.*	---	Not supported
H4a	*The relationship of Subjective Norms with intentions to engage in academic productivity behaviours is positively moderated by Extraversion.*	---	Not supported
H4b	*The relationship of Subjective Norms with intentions to engage in academic productivity behaviours is positively moderated by Agreeableness.*	---	Not supported
H5	*Conscientiousness is positively related to Perceived Behavioural Control towards capabilities in publishing.*	---	Not supported

4.40 Multi-Group Analyses of Measurement Models and Structural Models: Overall Model Fit and Path Coefficients

This last section presents the results from a set of multi-group analyses performed in order to compare estimates from the two Time 1 samples, i.e., the Social Science and Science Technology samples. These analyses allow a determination of whether the measurement models for the two samples are significantly different from each other, and whether the structural models (in particular, the estimated path coefficients) differ from each other. Table 4.40.1 reports the overall model fit for each of the five models (Model 1-5) that were estimated. Table 4.40.2 presents the estimated path coefficients from the preferred multi-group model.

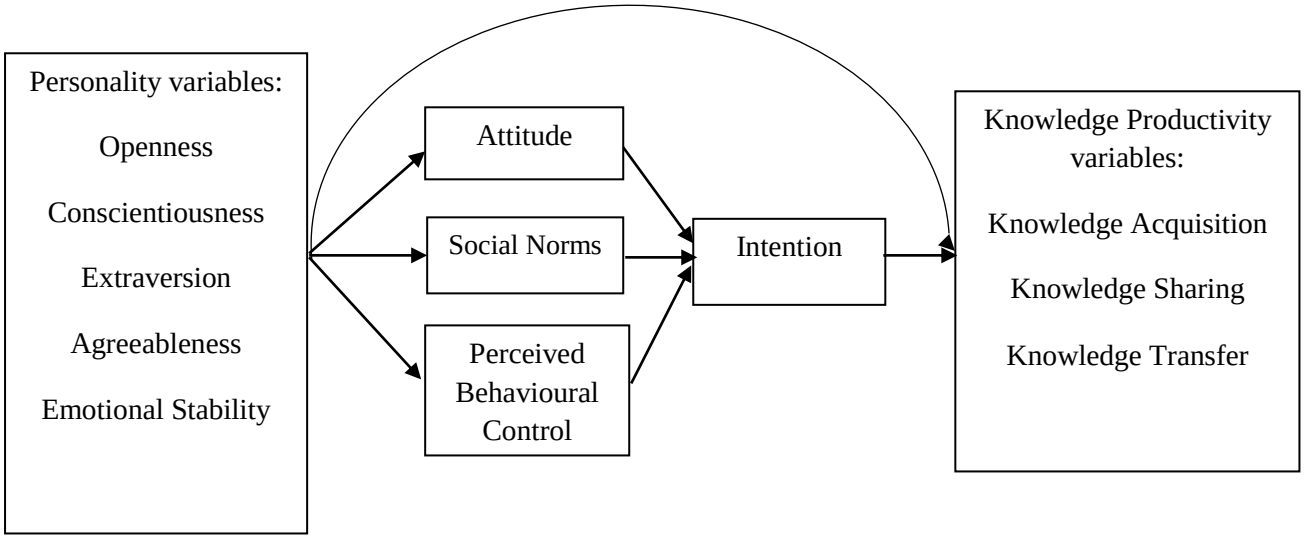
4.40.1 Results from multi-group measurement models

The first measurement model consisted of twelve latent constructs that corresponded to the focal study variables, along with their measured indicators. In addition, a higher order Knowledge Productivity Behaviour construct was specified, which used the three latent constructs of Knowledge Acquisition, Knowledge Sharing and Knowledge Transfer as indicators. All of the latent constructs were freely estimated, but this time the model is estimated as a multi-group model. No equality constraints are placed in Model 1 while equality constraints on all factor loadings are applied in Model 2. As can be seen from the fit indices for Model 1 of Table 4.40.1, although there was a statistically significant chi-square value (2566.529, df = 1147, p = <.001) which suggests some degree of misfit. However, approximate fit indices suggest that the measurement model with no equality constraints fit the data adequately, with *RMSEA* = .050, *CFI* = .925, and *SRMR* = .055. Model 2 placed equality constraints on the parallel factor loadings. The chi-square test for this model was also statistically significant, χ^2 =2593.280, df = 1172, p <.001, but the change in chi-square from Model 1 to Model 2 was not statistically significant, indicating that factor loadings in the two groups were equivalent, $\Delta\chi^2$26.751, df = 25, p = .368. The alternative fit indices for Model 2 also indicate an adequate fit to the data for this model, with *SRMR* = .057, *RMSEA*=.050 and *CFI* = .952. The equivalence of the factor loadings for the measurement models of the two samples allowed proceeding on to test whether the structural paths for the two samples were also equivalent.

4.40.2 Results from multi-group structural models

Three multi-group structural models (Models 3, 4 and 5) were estimated. These models all had the same basic structural specification as the single-group models estimated earlier for the Time 1 Social Sciences and Science Technology samples. Model 3 served as the baseline structural model, as it imposed no equality constraints on any structural paths, although it retained the equivalent factor loadings tested previously with the two measurement models. More specifically, this structural model is indicated in the figure 4.40.

Figure 4.40 Model 3: Structural Model- paths freely estimated



Note. For Model 1, the following paths were fixed to zero: (a) direct paths from Conscientiousness to all three KPB outcome variables; (b) direct paths from Emotional Stability to Knowledge Acquisition and Knowledge Sharing; (c) the direct path from Agreeableness to Knowledge Sharing. For Model 2, all non-zero path coefficients in Model 1 were constrained to be equal across the two samples. For Model 3, the path from Openness to Social Norms was freely estimated in the two groups, but all other non-zero paths were constrained equal in the two groups.

Model 3 again fit the data adequately according to alternative fit indices, *RMSEA* = .051, *CFI* = .918, and *SRMR* = .062, although it did have a statistically significant chi-square value of 2772.768, *df* = 1224, *p* = <.001. Model 4 placed cross-group equality constraints on all structural paths. Model 4 had χ^2 =2806.070, *df*= 1240, *p* <.001, *SRMR* = .050, *RMSEA* = .064 and *CFI* = .918 which suggest an adequately fitting model. However, the chi-square

difference test for the comparison of the baseline Model 3 with the fully constrained Model 4 was statistically significant, $\Delta\chi^2$ =33.302, *df* =16, *p* =.007, indicating that at least one of the structural paths was significantly different across the two models.

The details of the two models were inspected to identify potentially different paths. These suggested that the path from Social Norms to Attitude might differ between the two groups. Thus, Model 5, which placed equality constraints on all structural paths except Social Norms to Attitude, was estimated. Model 5 had a chi-square value of 2794.132, *df* = 1239, *p* = <.001. This value was compared with the baseline structural Model 3, and the chi-square difference between the two models was not statistically significant, $\Delta\chi^2$ =21.264, *df* =15, *p* =.126. The lack of significant difference between these two models leads to a conclusion that all structural paths are equivalent in the two groups except Social Norms to Attitude. Model 5 also had adequate values of *RMSEA* = .050, *CFI* = .918, and *SRMR* = .064. Furthermore, this table also reported the changes on measurement models between Model 4 and Model 3, with a significant chi-square value of 33.302, *df* = 16, *p* = .007., indicates a good fit model. While Model 5 and Model 3, reported with a non-significant chi-square value of 21.264, *df* = 15, *p* = .126.

Overall in T1 Model 5 implies that when personality and behavioural were included in the model only one personality predictor Openness trait is needed to adequately capture effects for KPB constructs: KA KS and KT and marginally significant for Extraversion. However, Subjective norms, Emotional Stability and Conscientiousness did not have effects on behavioural intentions for KA, KS and KT.

The results presented in the top portion of Table 4.40.2 shows the effects of the Big Five personality traits (Openness) on Attitude. It is reported that Openness had significant path coefficients on Attitude, with values of SS β= .13, *p*= <.001. and ST β= .18, *p*= <.001.

Table 4.40.2 also reported the behavioural component variables significant path coefficients when effects of all behavioural component variables were included in the model except for Subjective Norm. Intention components had significant path coefficients with KPB with variance remained the same for both model for each of KPB elements in both Social Science and Science Technology samples, with values of *p*= <.001. The remaining two; Attitude and PBC also shows strong significant effects on Intention which has a value of *p*= <.001.

Preceding towards above model, this table describes the effects of the Big Five personality traits; Openness, Extraversion and Agreeableness had significant or close-to significant path coefficients when the effects of the personality variables were included in the model, which has a value ranging of p= <.015., except for Emotional Stability trait with Knowledge Transfer, has no significant effects with value of β= -.05, p= .117.

Table 4.40.1 Overall multi-group analyses results

Model	X^2	df	ρ	RMSEA (90% CI)	CFI	SRMR
Measurement models						
1.No equality constraints	2566.529	1147	<.001	.050 (.048, .053)	.925	.055
2.Equality constraints on all factor loadings	2593.280	1172	<.001	.050 (.047, .052)	.952	.057
Model 2 vs Model 1:	26.751	25	.368	.000	.027	.002
Structural models						
3.No equality constraints on structural paths	2772.768	1224	<.001	.051 (.048, .053)	.918	.062
4. Equality constraints on structural paths	2806.070	1240	<.001	.051 (.048, .053)	917	.070
5. Equality constraints on all structural paths except Social Norms → Attitude	2794.132	1239	<.001	.050 (.048, .053)	918	.064
Model 4 vs Model 3:	33.302	16	.007			
Model 5 vs Model 3:	21.264	15	.126			

Note: RMSEA = Root Mean Square Error of Approximation; CFI = Comparative Fit Index; SRMR = Standardized Root Mean Square Residual.

Table 4.40.2 Estimates of structural paths from multi-group analyses

		Unstandardized Coefficients		*Standardized Coefficients*	
Path	***B***	***se***	***ρ***	***β***	***β***
Personality to TPB variables					
Open →Attitude	.20	.051	<.001	.13	.18
Open →Norm[a]		---	---	---	---
Social Science	.83	.066	<.001	.74	---
Science Technology	.58	.073	<.001	---	.68
Relations within set of TPB variables					
Attitude →Intention	.58	.104	<.001	.43	.35
PBC → Intention	.55	.049	<.001	.52	.56
Direct effects on KA					
Intention →KA	.26	.026	<.001	.40	.41
Openness →KA	.45	.074	<.001	.34	.38
Extraversion → KA	.25	.078	<.001	.16	.15
Agreeableness → KA	-.26	.077	<.001	-.18	.18
Direct effects on KS					
Intention →KS	.26	.27	<.001	.31	.34
Openness →KS	.42	.068	<.001	.25	.30
Extraversion → KS	.23	.082	.005	.12	.11
Direct effects on KT					
Intention →KT	.22	.021	<.001	.34	.40
Openness →KT	.36	.075	<.001	.27	.35
Emotional Stability →KT	-.05	.030	.117	-.05	-.05
Extraversion → KT	.18	.075	.015	.12	.12
Agreeableness → KT	-.29	.088	<.001	-.20	-.21

Note. The following path coefficients were fixed to 0 in both groups given prior results showing no significant relationship: Norm → Intention, Emotional Stability and Conscientiousness →KA, Emotional Stability, Agreeableness and Conscientiousness →KS, Conscientiousness → KT.

a. this parameter was estimated freely in both groups.

4.40.3 Summary of Multi-Group Analyses Results

Based on the values for the multi-group measurement model analysis results reported in Table 4.40.1, the T1 data for both the Social Science and Science Technology samples had equivalent factor structures, at least with respect to values of the factor loadings on all latent constructs. This allowed for further estimation to determine whether the structural paths were also equivalent in the two samples. Subsequently, results of the two model; Model 3 and Model 4 were estimated to recognize possible different paths. These evidence that the path from Openness to Social Norms might be different between the Social Science and Science Technology samples, but that all remaining path coefficients were equivalent.

As a result, Table 4.40.1 shows the overall estimates of the path coefficients for the final model T1 Model 5 (equality constrains on all structural paths except for social norms) for both Social Science and Science Technology samples. This model shows the overall significant effects of the personality and behavioural component with three elements of KPB; KA (Knowledge Acquisition), KS (Knowledge Sharing) and KT (Knowledge Transfer).

Information in the Table 4.40.2 indicating the estimation set of structural models for both sample Social Science and Science Technology. In this estimation all structural paths are equivalent in the two samples with the exception of the path from Openness to Social Norms. The results show Openness to Social Norms path was significantly different in the two samples and although it was positive and statistically significant in both samples, was stronger in the Social Science sample ($\beta = .83$) than in the Science Technology sample ($\beta = .58$).

Additionally, Table 4.40.2 reported that when both Social Science and Science Technology sample estimated, overall finding implies that when personality and behavioural were included in the model shows only one strong personality predictor Openness trait is needed to adequately capture effects for KPB constructs: KA KS and KT. Another personality traits; Extraversion is reported marginally significant for KA ($\beta = .25$), KS ($\beta = .23$) and KT ($\beta = .18$), while Agreeableness are only significant for KA and KT. However, Subjective norms, Emotional Stability and Conscientiousness did not have effects on behavioural intentions for KA, KS and KT.

CHAPTER 5: TIME 2 QUANTITATIVE ANALYSIS

5.0 Introduction

This chapter presents the results of data analyses performed using follow up data collected approximately a year after the original data collection. The second survey builds on the original survey to collect measures of the Knowledge Productivity Behaviours that academics actually engaged in following the first survey, in order to make a stronger causal argument about the effects of the personality and for the TPB variables. This chapter begins with the data cleaning process for the second data collection, and followed by overview results of Science and Technology sample and the results of second data of Social Science sample.

5.1 Data collection

For the second study, an approach was taken identical to the main study, relying on an online survey methodology with a working academic sample from Malaysia Public University. The online survey was open for responses from 9 October 2017 until 7 December 2017. A total of six (6) attempts were made in distributing the online survey. For the first phase, the first distribution attempt was made in October (09/10/2017) to all thirteen (13) university branch campuses in Malaysia. In the first week after distribution, the researcher received seventy five (75) responses, and subsequently by another two time resent the survey on (23/10/2017 and 30/10/2017) resulting four hundred and four (404) responses in totals. In the following weeks, the survey was resent three times in November. Throughout this month, third attempt in distributing the questionnaire was made on (13/11/2017) and each weeks after on (20/11/2017 and 27/11/2017) with total of excellent respond rate of nine hundred and sixty two (962). Lastly, the final online survey was close in December on (07/12/2017) resulting nine hundred and seventy four (974) responses in totals.

5.2 Data cleaning

A total of 974 persons responded to the follow-up survey. However, this sample size was slightly reduced in the preliminary data cleaning process, resulting in useable data from a total 968 respondents who were in one of two major disciplinary units within the university system. More specifically, one participant identified himself or herself as a non-academic and five participants were also eliminated from the sample from further analysis because they failed to complete at least 80% of the survey items. The data cleaning procedure resulted in

useable responses from 527 respondents in the School of Social Sciences, and 432 useable responses from respondents in the School of Science and Technology.

5.3 Data matching

After data cleaning was completed, the next step was to match this data to responses from the first survey. In order to match the respondents from survey time 1 and survey time 2, 10 characteristics were used birthday month, place of birth, age, gender, school, qualification, position, first year of appointment, campus and years of services in the university. Values of the responses on a set of 6 of these characteristics that were expected to be stable were used to create a unique code in both the Time 1 and Time 2 datasets. These 6 characteristics were; birthday month, place of birth, gender, school, first year of appointment, and campus. This remaining 4 characteristic were examined by hand later on.

In creating the unique code, the Excel software was used to perform this. Survey time 1 and survey time 2 and all the 6 characteristics were listed and by applying the 'concatenate' formula in Excel the unique code are created with total of 1790 cases (Time 1 and Time 2). With the pre-unique code have been determine, all the data were imported in SPSS and data with duplicate cases were identify. In order to get the right match all cases with duplicate codes were examined by their time survey (Time 1 and Time 2). Duplicate codes within the same data collection effort were removed, because it was not possible to unambiguously match these cases with their counterpart in the other data collection effort. As a result there were 288 matches.

Subsequently, with the 288 matches based on the codes found from Time 1 and Time 2 surveys, each of the Time 1 and Time 2 matches were pull out separately in SPSS and assigned a match numbers. In a new data set with match numbers all data from Time 1 and Time 2 surveys are been pull in to represent match cases. This time the 4 characteristics (age, qualification, position and services) which have been left out before were been examined. These 4 characteristics were imported in the match cases then the 'compute new variable' features in SPSS were applied by giving them a new values for example age from Time 2 survey minus age from Time 1 survey should equal to 0 or 1. Match cases which have more values than that are being removed except for services -1 to 1 value are accepted due to human error.

After all 4 characteristics were examined there were a total of 156 unambiguous matches. Even though results from data cleaning is large, unfortunately not all from the data can be use as it does not offers identical matches. Broken down by school, this was useable responses available for further analysis from 120 respondents in the School of Social Sciences, and 36 useable responses from respondents in the School of Science and Technology.

5.4 Overview Science Technology Sample: Participant Descriptive Statistics and Work Characteristics

A total of 236 respondents from Science Technology answered the questionnaire. The 236 respondents are academics from Applied Sciences, Chemical Engineering, Civil Engineering, Computer & Mathematical Sciences, Dentistry, Electrical Engineering, Health Sciences, Mechanical Engineering, Medicine, Pharmacy and Plantation & Agro technology. However, only 36 persons from this school could be matched to their Time 1 data. SPSS version 20 was used to perform descriptive analysis of the matched Science and Technology sample. This included analyses describing the demographic profile of respondents, reliability estimation and inferential statistical analysis (i.e., correlation) to test the research hypotheses.

5.5 Main Study: Social Science Sample

This section explains the results of analyses of follow-up data that have been collected from the Social Science sample that were able to matched to their Time 1 responses. There were a total of 120 match respondents. They are academics from Faculty of Information, Business & Management, Accountancy, Hotel & Tourism Management, Administrative Science & Policy Studies, Law, Art & Design, Academy of Language Studies, Communication & Media Studies, Academy of Contemporary Islamic Studies, Music and Education.

5.6 Social Sciences Sample: Participant Descriptive Statistics and Work Characteristics

Table 5.6 provides an overview of the participant demographic characteristic from the matched Social Sciences respondents.

Table 5.6 Social Science Sample: Demographic and Work Characteristics

Description	Frequency (n)	Percentage (%)
Gender		
Male	25	20.8
Female	95	79.2
Age (in years)		
24-29	3	2.5
30-34	31	25.8
35-39	18	15
40-44	21	17.5
45-49	23	19.2
50-54	18	15
55-59	6	5
Highest Qualification		
Master's degree	88	73.3
Doctoral degree	32	26.7
Years of Services		
1-4 years	7	5.8
5-9 years	51	42.5
10-14 years	18	15.0
15-19 years	20	16.7
20-24 years	8	6.7
25- 29 years	10	8.3
30-34 years	6	5.0
Faculty Position		
Academic: Admin	47	39.2
Academic: Non- Admin	73	60.8
Position Level		
Tutor, Contract, Part-time Lecturer	1	.8
Lecturer	42	35.0
Senior Lecturer	66	55.0
Associate Professor	10	8.3
Teaching		
Undergraduate	93	77.5
Undergraduate & postgraduate	27	22.5
Student Supervision		
None	36	30
Yes undergraduate only	53	44.2
Both undergraduate & postgraduate	31	25.8

Based on table 5.6, the majority of respondents (79.2%) were female. Respondents age varied, the largest group were aged in their thirties (40.8%), followed by 36.7% in forties, 20% in fifties, and only few 2.5% in their twenties. In terms of higher academic qualification,

majority of them (73.3%) had their highest degree being a Master's degree, 26.7% had a Doctoral degree. Meanwhile in terms of years of service, 42.5% of participants have 5-9 years of service. The next largest groups have 15-19 years of service (16.7%), 10-14 years of service (15%). Of those remaining, 8.3% have 25-29 years of service, 6.7% have 20-24 years of service, 5% have 30-34 years of service, and a few 5.8% have 1-4 years of. Looking at their faculty positions, 60.8 % indicated that they did not involved with administrative duties and 39.2% reported having some involvement with administrative duties. Furthermore, among the respondents, half of the group position; 55% held the position of senior lecturer and 35% lecturer, followed by 8.3% associate professor, and .8% tutor, contract part-time lecturer. Furthermore 77.5% of the respondents reported teaching undergraduate students only, and the rest were involved in teaching both undergraduate and postgraduate students. Finally, looking upon supervision of theses and dissertations, 44.2% undergraduate theses/dissertations only, 30% were not involved in supervision and 25.8% of the respondents supervised both undergraduates and postgraduates.

5.7 Assessment of Reliability and Descriptive Statistics for Social Science Sample Focal Variables

As shown by the values reported in Table 5.7, all five personality scales in the study are adequately reliable since all values of alpha were more than .60. Indeed, four of the five values fall in the range suggesting good reliability, with the exception being conscientiousness, with a=.67. Therefore, the relationships among the items are reliable for further analysis. Next, all TPB variables indicate very strong reliability, with all alpha coefficients above .80. Therefore, it can be concluded that measurement for the TPB variables used is very acceptable and the relationships among the items are reliable for further analysis. Finally, all Knowledge Productivity variables were estimated and resulted very good internal consistency for KS (.91) and KT (.75). However, the KA variable had a low alpha of alpha of .57. This may be due to the relatively small number of items (4) in the scale and their varied nature. On the other hand value of alpha for composite KPB was .85.

This following paragraph describes the univariate distributions of the main study focal variables, as well as describing the bivariate relationships within each of the three different sets of variables of Big Five Personality, Theory of Planned Behaviour and KPB variables. Information in Table 5.6 indicates the overall mean of Big Five Personality. Results reported overall mean for Extraversion is 3.10, Agreeableness is 3.88, Conscientiousness is 3.77,

Emotional Stability is 3.15, and Openness is 3.53, again suggesting that on average, participants tended to respond above the mid-point of the 5-point response scale. SD's were about half a scale point range from .44 (Openness) to .67 (Emotional Stability).

As shown by the values reported in Table 5.7 shows the descriptive analysis for the Theory of Planned Behaviour variables. Based on the table, the overall mean for Attitude is 6.11, Norm is 5.45, Perceived Behavioral Control is 5.02, and Intention is 5.72, suggesting that most respondents were favourably inclined towards presenting at conferences and publishing papers. Standard deviations range from .74 to 1.06. Based on the table, the highest skewness value is Intention, which has a value of -1.16.

The results presented in Table 5.7 shows the overall means for the Knowledge Productivity Behaviour variables: Knowledge Acquisition = 2.83, Knowledge Sharing =3.02, Knowledge Transfer = 2.39 and composite KPB = 0.00.(due to its creation from standardize score) This described that most of the respondents tend to respond below mid-point of the 5-point response scale for KA, KS KT and composite KPB. The highest standard deviation is for Knowledge Sharing which is .85 while the lowest is Knowledge Transfer which is .52. Based on the table, the highest skewness value is KT, which has a value of .75.

Table 5.7 Social Science Study Sample: Descriptive Statistics for Focal Variables

Variables (Items)	α	Min	Max	Mean	SD	Skew	Kurtosis
Big Five Personality							
Extraversion	.80	1.00	5.00	3.10	.62	.06	.67
Agreeableness	.70	3.00	5.00	3.88	.48	-.20	.12
Conscientiousness	.67	3.00	5.00	3.77	.50	-.11	-.57
Emotional stability	.82	2.00	5.00	3.15	.67	-.09	-.47
Openness	.68	3.00	5.00	3.53	.44	.35	.47
Theory of Planned Behaviour							
Attitude	.87	4.00	7.00	6.11	.74	-.88	.45
Norm	.84	2.00	7.00	5.45	.91	-.50	.30
PBC	.88	2.00	7.00	5.02	1.03	-.42	-.07
Intention	.94	2.00	7.00	5.72	1.06	-1.12	1.49
Knowledge Productivity Behaviour (KPB)							
Knowledge Acquisition (KA)	.57	1.00	5.00	2.83	.65	.02	.90
Knowledge Sharing (KS)	.91	1.00	5.00	3.02	.85	.62	.08
Knowledge Transfer (KT)	.75	1.00	5.00	2.39	.52	-.81	.51
Composite KPB	.85	-3.01	2.92	0.00	1.00	-.30	.71

Note. N = 120.

5.8 Social Science Sample: Correlations among Focal Variables

This next section describes the all possible bivariate relationships within each of the three different sets of variables (i.e., Big Five Personality, Theory of Planned Behaviour, and Knowledge Productivity variables).

Table 5.8 shows all bivariate relationships between pairs of Big Five Personality variables were positive. Extraversion, Conscientiousness and Agreeableness, all significantly and moderately related with each other with values of the correlations ranging from .19 to .38, except for Emotional Stability, and Openness with value range of.14 did not show significant relationships with the other variables, this lack of statistical significance is in contrast to the Time 1 survey result and likely reflects that analyses using only the Time 1 data were transformed with a substantially larger sample size.

Information in Table 5.8 reported the correlations amongst the Theory of Planned Behaviour Variables. As was shown in the time 1 survey main study, all four of the TPB variables, i.e., Attitude, Norm Perceived Behavioural Control and Intention, have strong, positive, and statistically significant relationships with each other, with pearson correlations ranging from .47 to .62. These findings are consistent with the TPB general model, which suggests that intentions are a function of norms, perceived behavioural control and intentions. These relationships will be more formally modelled and tested in the later SEM analyses.

Table 5.8 presents the correlations for Knowledge Productivity Behaviour Variables. Based on the table it indicates that all of the variables; Knowledge Acquisition, Knowledge Sharing, Knowledge Transfer and composite KPB shows significant relationships with each other,with pearson correlations in the range of .32 and above. The result shows that there are positive relationships between all Knowledge Productivity Behaviour variables. Given this set of strong relationships, it seems reasonable to also create a composite KPB variable that captures all three aspects of Knowledge Productivity Behaviours.

Table 5.8 Social Science Study Sample: Observed Correlation Matrix for Focal Variables

Variables (Items)	2	3	4	5	6	7	8	9	10	11	12	13
Big Five Personality												
1. Extraversion	.30**	.19*	.20*	.37**	.06	.08	-.12	.11	.06	.11	.06	.10
2. Agreeableness	---	.36**	.38**	.25**	.17	.20*	.07	.14	.12	.08	-.08	.05
3. Conscientiousness		---	.26**	.36**	.15	.01	.02	.11	.11	.18*	-.07	.09
4. Emotional stability			---	.14	.01	.00	.16	.02	.01	-.09	-.17	-.10
5. Openness				---	.28**	.16	.26**	.41**	.25**	.28**	.16	.29**
Theory of Planned Behaviour												
6. Attitude					---	.62**	.39**	.65**	.26**	.19**	.26**	.30**
7. Norm						---	.47**	.47**	.31**	.13	.24**	.29**
8. PBC							---	.60**	.35**	.22**	.37**	.36**
9. Intention								---	.42**	.35**	.42**	.51**
Knowledge Productivity Behaviour (KPB)												
10. KA									---	.53**	.73**	.82**
11. KS										---	.32**	.80**
12. KT											---	.73**
13. Composite KPB												1.00

Note. N = 120. ** p < .01 ,* p < .05

5.9 Social Science Sample: Relationships across Sets of Variables

Further analysis based on correlation coefficients was used to evaluate the correlations between the variables that are implied by the theoretical model. That is, they explore the relationships of the three different sets of variables; Big Five Personality, Theory of Planned Behaviour, and Knowledge Productivity variables.

Table 5.9 shows that only two of the Personality variables have statistically significant relationships with the Theory of Planned Behaviour variables. This result expected, as in the previous survey time 1 resulted only openness has significant effects on Attitude. Majority of the variables are not statistically significant except for Openness and Agreeableness effects had significant value with certain TPB variables. The bivariate relationships of the Personality Traits with the Theory of Planned Behaviour variables are consistent with hypotheses H3a and H4a. Specifically, they provide evidence for the proposed positive relationships of Openness with Attitude, (H3a), r= .28 and Agreeableness with Norm (H4a), r = .20. Unfortunately the rest of the hypotheses are not supported.

Table 5.9 Social Science Sample: Correlations for Personality Traits with Theory of Planned Behaviour Variables

	Attitude	Norm	PBC	Intention
Extraversion	.06	.08	-.12	.11
Agreeableness	.17	.20*	.07	.14
Conscientiousness	.15	.01	.02	.11
Emotional stability	.01	.00	.16	.02
Openness	.28**	.16	.26**	.41**

Note. $N = 120$. ** $p < .01$

The correlations in Table 5.10 all involve relationships of Knowledge Productivity Behaviours with the proposed antecedent Big Five personality and TPB variables. Results show positive correlation between Theory of Planned Behaviour variables and Knowledge Productivity Behaviour, with range of .24 and above, except for norm and KS r = .13. However the results support the positive relationships with KPB of (a) Intention (H2a), r = .51; (b) Attitude (H2b), r = .30; (c) Norm (H2c), r = .29; and (d) PBC (H2d), r = .36. This result expected, as in the previous survey time 1 resulted reported strong effects of TPB variables on KPB. Meanwhile, in contrast to TPB results, the Big Five Personality variables show much poor results. Only hypotheses H1a Openness trait result support the proposed

positive relationships with KPB with value of r = .29. This is not surprising as the results in time 1 survey for Social Sciences sample reported yet again only h1a hypotheses are supported Nevertheless, results support the positive relationships Conscientiousness with KS r = .18, Openness with KA r = .25 and Openness with KS r = .28

Table 5.10 Social Science Sample: Correlations of Personality and Theory of Planned Behaviour with Knowledge Productivity Behaviour

	KA	KS	KT	Composite KPB
Extraversion	.06	.11	.06	.10
Agreeableness	.12	.08	-.08	.05
Conscientiousness	.11	.18*	-.07	.09
Emotional stability	.01	-.09	-.17	-.10
Openness	.25**	.28**	.16	.29**
Attitude	.26**	.19**	.26**	.30**
Norm	.31**	.13	.24**	.29**
PBC	.35**	.22**	.37**	.36**
Intention	.42**	.35**	.42**	.51**

Note. $N = 120$. ** $p < .01$ * $p < .05$

5.10 T2: Social Sciences Sample, Tests of Hypotheses H1a-e: Relationships of Big Five to KPB Variables.

The tests of models using the T2 (time 2) Social Sciences outcome data were designed to parallel as closely as possible the approach taken earlier for models tested using the T1 outcomes. However, it was necessary to take into consideration the smaller sample size of the T2 data set, which prohibited the use of a latent variable approach in the T2 models. These analyses include testing structural equation models for Hypotheses H1a-e, which proposed that Extraversion, Openness, Emotional Stability and Conscientiousness have positive relationships with KPB, and that Agreeableness may have both positive and negative relationships with KPB, potentially resulting in an overall null association of Agreeableness with KPB.

Similarly to T1, for the T2 outcomes, two related sets of models were estimated and reported in this section: (a) a set of models with a single, higher-order KPB composite as the outcome, and (b) a set of models in which the three KPB elements of knowledge acquisition, knowledge sharing and knowledge transfer were treated as separate outcomes.

5.10.1 Effects of the Big Five on the Higher Order KPB Construct

Three models were estimated looking at the direct effects of the Big Five personality variables on the higher-order KPB construct. Table 5.10.1.1 reports the overall model fit for each of these three models, and Table 5.10.1.2 reports the estimated path coefficients for the models.

5.10.2 Big Five Effects on Higher Order KPB Composite: Overall model fit and path coefficients

The specification of T2 Model 1 included paths from each of the Big Five variables to the higher-order KPB composite, in order to test for the unique effects of all five variables as a set. As can be seen in Table 5.10.1.1, this model fit the data quite well, with a non-significant chi-square value of 12.317, df = 10, p = .26, and good values of RMSEA = .044, CFI = .962, and SRMR = .017. Estimates of the path coefficients for T2 Model 1, as shown in the first section of Table 5.10.1.2, indicate that two of the five personality variables had significant or close-to significant path coefficients when the effects of all five personality variables were included in the model. More specifically, in the T2 Model 1 there were statistically significant effects for Openness, β= .340, p= .035 and the effect for Emotional Stability was marginally significant, β= -.179, p= .075.

However, it was clear that the paths for extraversion, agreeableness and conscientiousness were not even close to being statistically significant (all p's were greater than .50). Thus, a second model (T2 Model 2) was estimated trimming the paths from these three variables to the KPB construct, although all of the Big Five predictors were still left in the model and allowed to covary with each other. In this model, Openness still had a statistically significant effect, and the effect for Emotional Stability was not statistically significant. Thus in yet another model (T2 Model 3), Emotional Stability was also trimmed. In this third, and final model, only one of Big Five predictor variables had a statistically significant predictive path to the higher order KPB construct, specifically, Openness had a moderate, positive effect on KPB, β= .358, p =.006.

Overall, in all three of these models about 12-15% of the variance in the higher order KPB construct was explained, In order to have standardized results, the author decided to trimming out models, since it was possible that there was enough shared variance amongst the set of five variables to hide otherwise significant effects on KPB. However, it appeared that the

only Openness effect adequate to capture effect for KPB. The same finale result for T2 was obtained with this procedure.

Table 5.10.1.1 Model Fit Statistics for Tests of T2 H1a-H1e using the Higher Order KPB Construct

T2 Model	X^2	df	ρ	RMSEA (90% CI)	CFI	SRMR
(T2) 1	12.317	10	.26	.044 (.000, .114)	.962	.037
(T2) 2	12.176	13	.51	000 (.000, .086)	1.000	.040
(T2) 3	13.729	14	.47	000 (.000, .087)	1.000	.044

Note. N = 120. RMSEA = Root Mean Square Error of Approximation; CFI = Comparative Fit Index; SRMR = Standardized Root Mean Square Residual.

Table 5.10.1.2 Tests of T2 H1a-H1e: Path coefficients for relationships of Big Five to higher order KPB factor

	Unstandardized Coefficients			*Standardized Coefficients*
Model	***B***	***se***	***ρ***	***β***
T2 Model 1: Predicting KPB from all Big 5 Predictors				
Extraversion	-.004	.101	.968	-.006
Agreeableness	.082	.130	.526	.090
Conscientiousness	.059	.103	.566	.066
Emotional stability	-.118	.066	.075	-.179
Openness	.342	.163	.035	.340
R^2 = .159				
T2 Model 2: Prediction from Emotional Stability and Openness				
Extraversion	-	-	-	-
Agreeableness	-	-	-	-
Conscientiousness	-	-	-	-
Emotional stability	-.088	.062	.155	-.130
Openness	.388	.136	.004	.379
R^2 = .146				
T2 Model 3: Prediction from Openness				
Extraversion	-	-	-	-
Agreeableness	-	-	-	-
Conscientiousness	-	-	-	-
Emotional stability	-	-	-	-
Openness	.380	.138	.006	.358
R^2 = .128				

5.11 Effects of the Big Five on the KPB Components (KA, KS, KT)

In this next set of models, the Big Five variables were specified as predictors of the three separate lower-order KPB components; Knowledge Acquisition (KA), Knowledge Sharing (KS) and Knowledge Transfer (KT). Again, an initial model (T2 Model 4) consistent with simultaneously testing Hypotheses 1a-e was specified and estimated. This was followed by tests of two additional models (T2 Models 5 and 6) that trimmed non-significant paths to each of the KPB components.

5.11.1 Big Five Effects on KA, KS, and KT: Overall model fit and path coefficients

T2 Models 4, 5 and 6 were estimated to determine the overall significant effects of the personality traits on each of the three elements of KPB, namely, KA (Knowledge Acquisition), KS (Knowledge Sharing) and KT (Knowledge Transfer). T2 Model 4 includes paths from all five of the personality predictors to each of the three outcome variables. The remaining two models (i.e., T2 Model 5 and 6) fix to zero (i.e., trim) the non-significant predictor(s) from the prior model(s) that made the lowest contribution to the full model.

The T2 Model 4 is a saturated model because it allows all possible relationships amongst the full set of variables. Thus, T2 Model 4 has a chi-square fit statistic of zero, with zero degrees of freedom. In contrast, the fixed paths of T2 Model 4 and T2 Model 5 mean that fit indices are available for these models, as reported inTable 5.11.1.1. Neither T2 Model 5 nor T2 Model 6 had a statistically significant chi-square value, with p's of .965 and .929, respectively. This indicates that neither of these models fit significantly worse than T2 Model 4, and also that T2 Model 6 did not fit significantly worse than did T2 Model 5. RMSEA, CFI and SRMR fit indices were also acceptable for all models. Thus, T2 Model 6 is preferred, as it is the most parsimonious model of the three, as indicated by its higher number of degrees of freedom.

Table 5.11.1.1 Overall model fit for tests of T2 H1a-e

Model	x^2	df	*p*	RMSEA (90% CI)	CFI	SRMR
(T2) 5	0.961	5	.965	.000 (.000, .000)	1.000	.014
(T2) 6	3.07	8	.929	.000 (.000, .031)	1.000	.019

Note. *N* = 120. RMSEA = Root Mean Square Error of Approximation; CFI = Comparative Fit Index; SRMR = Standardized Root Mean Square Residual.

Table 5.11.1.2 Path coefficients from models of relationships of Big Five to higher order KA, KS and KT

	Unstandardized Coefficients			*Standardized Coefficients*
Model	***B***	***se***	***ρ***	***β***
T2 Model 4: Predicting KPB component from all Big 5 Predictors				
Outcome = KA				
Extraversion	-.043	.113	.705	-.041
Agreeableness	.116	.125	.353	.087
Conscientiousness	-.005	.122	.968	-.004
Emotional stability	-.030	.083	.721	-.031
Openness	.346	.165	.036	.239
R^2 = .062				
Outcome = KS				
Extraversion	-.006	.150	.969	-.004
Agreeableness	.161	.218	.461	.094
Conscientiousness	.223	.146	.128	.135
Emotional stability	-.253	.105	.016	-.206
Openness	.429	.193	.026	.230
R^2 = .116				
Outcome on KT				
Extraversion	.069	.089	.436	.083
Agreeableness	-.082	.122	.498	-.077
Conscientiousness	-.092	.098	.350	-.089
Emotional stability	-.086	.081	.289	-.112
Openness	.243	.132	.064	.208
R^2 = .058				
T2 Model 5				
KA: Prediction from Agreeableness and Openness				
Extraversion	-	-	-	-
Agreeableness	.117	.102	.248	.088
Conscientiousness	-	-	-	-
Emotional stability	-	-	-	-
Openness	.315	.156	.044	.217
R^2 = .064				
KS: Prediction from Agreeableness, Conscientiousness, Emotional stability and Openness				
Extraversion	-	-	-	-
Agreeableness	.184	.195	.344	.108
Conscientiousness	.222	.133	.094	.134
Emotional stability	-.236	.090	.009	-.193
Openness	.417	.174	.017	.223
R^2 = .119				
KT: Prediction from Extraversion, Emotional stability and Openness				
Extraversion	.067	.078	.388	.080

	Unstandardized Coefficients			*Standardized Coefficients*
Model	***B***	***se***	***ρ***	***β***
Agreeableness	-	-	-	-
Conscientiousness	-.110	.092	.231	-.106
Emotional stability	-.093	.075	.215	-.122
Openness	.232	.127	.068	.198
R^2 = .061				
T2 Model 6				
KA: Prediction from Openness				
Extraversion	-	-	-	-
Agreeableness	-	-	-	-
Conscientiousness	-	-	-	-
Emotional stability	-	-	-	-
Openness	.347	.154	.024	.239
R^2 = .057				
KS: Prediction from Conscientiousness, Emotional stability and Openness				
Extraversion	-	-	-	-
Agreeableness	-	-	-	-
Conscientiousness	.245	.133	.065	.148
Emotional stability	-.210	.085	.013	-.171
Openness	.457	.168	.006	.244
R^2 = .112				
KT: Prediction from Conscientiousness and Openness				
Extraversion	-	-	-	-
Agreeableness	-	-	-	-
Conscientiousness	-.116	.092	.207	-.111
Emotional stability	-.093	.072	.197	-.120
Openness	.268	.126	.033	.228
R^2 = .060				

5.12 Social Sciences Sample, Tests of Hypotheses H2a-d: Relationships of Theory of Planned Behaviour (TPB) to KPB Variables

Again, the aproach taken for testing the T2 (time 2) Social Sciences outcome data were designed as closely as possible as in previous models tested using the T1 outcomes. This section describes the results from testing structural equation models of the effects of the Theory of Planned Behaviour (TPB) to higher order KPB (Knowledge Productivity Behaviour) construct, as well as the three KPB elements, i.e., knowledge acquisition, knowledge sharing and knowledge transfer. The results from these models address T2 Hypotheses H2a-d, which proposed that Intention, has positive direct relationships with KPB and the effects of Attitude, Subjective norms and PBC has mediating effects on KPB via Intentions.

5.12.1 Effects of the Theory of Planned Behaviour (TPB) on the Higher Order KPB Construct

Two models were estimated looking at the direct effects of the Theory of Planned Behaviour (TPB) on the higher order KPB construct. The first model is totally consistent with the pattern of hypothesised relationships, the remaining model uses information from the first estimation to trim non-significant paths from the original model. Table 5.12.1.1 reports overall model fit for each of these two models, and Table 5.12.1.2 reports the estimated path coefficients for the models.

5.12.2 Structural Models of Theory of Planned Behaviour (TPB): Overall model fit and path coefficients

This next section describes models specified to test T2 Hypotheses H2a-d, proposing relationships of the TPB variables with Knowledge Productivity Behaviour. T2 Model 1.1 included paths from each of the behavioural component to the higher order of each KPB variable. As can be seen in Table 5.12.1.1, other fit indices suggested T2 Model 1.1 and 2.2 was not fitting adequately with p value ranging from .593 to .719. The results presented in the top portion of Table 5.12.1.2 indicate that both of T2 Model 1.1 and T2 Model 2.2 Intention components had significant path coefficients with KPB with 30% variance remained the same. Table 5.12.1.2 indicate that again only one behavioural component (Subjective Norm with values of β= -.035, p= .686) had none significant path coefficients when effects of all two variables were included in the model. The remaining two; Attitude and PBC shows strong significant effects on Intention which has a value of p= <.001. Overall, T2 Model 1.1 explained a total of about 56% of the variance in the on Intention. T2 Model 2.2 was identical to T2 Model 1.1, except it fixed the path from Subjective Norm to the KPB construct to zero. (The Subjective Norm effect was chosen to be removed since it was not statistically significant and had the highest p-value in the previous model.) Again, in T2 Model 2.2, the effect of Attitude and PBC shows strong significant path coefficients on Intention. Overall, T2 Model 2.2 shows similar 56% of the variance in Intention.

Table 5.12.1.1 Overall model fit for tests of T2 H2a-H2e

T2 Model	x^2	df	ρ	RMSEA (90% CI)	CFI	SRMR
(T2) 1.1	7.933	11	.719	.000 (.000, .072)	1	.042
(T2) 2.2	7.665	12	.811	.000 (.000, .059)	1	.041

Note. *N* = 120. RMSEA = Root Mean Square Error of Approximation; CFI = Comparative Fit Index; SRMR = Standardized Root Mean Square Residual.

Table 5.12.1.2 Path coefficient from models of relationships of TPB to higher order KPB factor

	Unstandardized Coefficient			*Standardized Coefficient*
Model	***B***	***se***	***ρ***	***β***
T2 Model 1.1: Predicting KPB from all TPB Predictors				
KPB on				
Intention	.254	.052	<.001	.554
R^2 = .565				
Intention on				
Attitude	.729	.125	<.001	.509
Subjective norm	-.040	.137	.768	-.035
PBC	.429	.093	<.001	.419
R^2 = .306				
T2 Model 2.2: Dropping Subjective Norm				
KPB on				
Intention	.254	.052	<.001	.554
R^2 = .564				
Intention on				
Attitude	.703	.111	<.001	.491
Subjective norm	-	-	-	-
PBC	.419	.078	<.001	.410
R^2 = .306				

5.13 Social Sciences Sample, Effects of the Theory of Planned Behaviour (TPB) on the KPB Components (KA, KS, KT)

In the next set of models, the Theory of Planned Behaviour variables were specified as predictors of all three KPB components. T2 Model 3.3 and 4.4 shows the overall significant effects of the behavioural component with three elements of KPB; KA (Knowledge Acquisition), KS (Knowledge Sharing) and KT (Knowledge Transfer). Additionally, in these initial model (T2 Model 3.3 and 3.4) non-significant paths were trimmed and estimated accordant with concurrently testing Hypotheses 2a-d.

5.13.1 Structural Models of Theory of Planned Behaviour (TPB) on the KPB Components (KA, KS, KT): Overall model fit and path coefficients

T2 Model 3.3 and T2 4.4 show the overall significant effects of the behavioural component with three elements of KPB; KA (Knowledge Acquisition), KS (Knowledge Sharing) and KT (Knowledge Transfer). In these models, the Theory of Planned Behaviour variables were specified as predictors of all three KPB components. T2 Model 3.3 includes all behavioural component predictors for each of the three outcome variables. The remaining models investigate the effects of trimming some of the non-significant paths from the full model (i.e., T2 Model 4.4).

Table 5.13.1.2 shows the overall significant all four behavioural effects with three elements of KPB; KA (Knowledge Acquisition), KS (Knowledge Sharing) and KT (Knowledge Transfer) were included in the model. T2 Model 3.3 included paths from each of the behavioural component to the higher order of each KPB variable. As can be seen in Table 5.13.1.1, other fit indices suggested T2 Model 3.3 and 4.4 were not fitting adequately (for specific values please refer to Table 5.13.1.1).

The results presented in the top portion of Table 5.13.1.2 shows the behavioural component variables significant path coefficients when effects of all behavioural component variables were included in the model. The results presented in the top portion of Table 5.13.1.2 indicate that both of T2 Model 3.3 and T2 Model 4.4 Intention components had significant path coefficients with KPB with variance remained the same for both model for each of KPB elements. Table 5.13.1.2, again indicate that only one behavioural component (Subjective Norm with values of β= -.035, p= .768) had none significant path coefficients when effects when all two variables were included in the model. The remaining two; Attitude and PBC shows strong significant effects on Intention which has a value of p= <.001. Overall, Model 3.3a explained a total of about 56% of the variance in the on Intention. In order to get more significant effects, T2 Model 4.4 fixed the path from Subjective Norm to the KPB construct to zero. As a result, again in T2 Model 4.4, the effect of Attitude and PBC shows strong significant path coefficients on Intention. Overall, T2 Model 4.4 shows similar 56% of the variance in Intention.

Table 5.13.1.1 Overall model fit for tests of T2 H2a-H2d

T2 Model	x^2	df	ρ	RMSEA (90% CI)	CFI	SRMR
(T2) 3.3	3.881	9	.919	.000 (.000, .036)	1	.026
(T2) 4.4	3.783	10	.956	.000 (.000, .000)	1	.026

Note. *N* = 749. RMSEA = Root Mean Square Error of Approximation; CFI = Comparative Fit Index; SRMR = Standardized Root Mean Square Residual.

Table 5.13.1.2 Path coefficient from models of relationships of TPB to higher order KPB factor

	Unstandardized Coefficient			*Standardized Coefficient*
	B	**se**	ρ	β
T2 Model 3.3: Predicting KPB from all TPB Predictors				
KA on				
Intention	.244	.055	<.001	.402
R^2 = .162				
KS on				
Intention	.245	.069	<.001	.313
R^2 = .098				
KT on				
Intention	.198	.047	<.001	.406
R^2 = .165				
Intention on				
Attitude	.729	.125	<.001	.509
Subjective norm	-.040	.137	.768	-.035
PBC	.429	.093	<.001	.419
R^2 = .565				
T2 Model 4.4: Dropping Subjective Norm				
KA on				
Intention	.244	.055	<.001	.402
R^2 = .162				
KS on				
Intention	.245	.069	<.001	.313
R^2 = .098				
KT on				
Intention	.198	.047	<.001	.406
R^2 = .165				
Intention on				
Attitude	.703	.111	<.001	.491
Subjective norm	-	-	-	-
PBC	.419	.078	<.001	.410
R^2 = .564				

5.14 Social Sciences Sample, Tests of the Mediating Role of Intention in the Relationships of Attitude, Subjective Norm and Perceived Behavioural Control with KPB

Preceding towards above model, this section describes the results from testing of the mediating effects of Intention in the Relationships of Attitude, Subjective Norm and Perceived Behavioural Control with KPB as well as the three KPB constructs, i.e., knowledge acquisition, knowledge sharing and knowledge transfer. Thus, results from these models address T2 Hypotheses H2a-d, which proposed Attitude, Subjective norms and PBC has mediating effects on KPB via Intentions.

5.14.1 Effects of mediating role of Intention in Attitude, Subjective Norm and Perceived Behavioural Control with KPB

A total of three hypotheses were estimated looking at the mediating effects of Intention in the Relationships of Attitude, Subjective Norm and Perceived Behavioural Control with KPB. The first results presented in Table 5.14.1.1 shows the mediating effect of Intention when effects of all behavioural component variables were included in the model. The results presented in the table shows that all T2 Sub-model H2a-d (i) indicate Intention components had significant effects in Attitude and PBC with KPB with value of p= <.001, leaving only one behavioural component Subjective Norm had none significant effects with values of .767. Subsequently, the second results presented T2 Sub-model H2a-d (ii) dropped Subjective Norm, reported that remaining Attitude and PBC remained strongly statistically significant effects.

Table 5.14.1.1 Effects of mediating role of Intention in Attitude, Subjective Norm and Perceived Behavioural Control with KPB

	Unstandardized Coefficient			***Standardized Coefficient***
Effects of Intention mediating role	***B***	***se***	***ρ***	***β***
T2 Submodel H2a- d (i)				
KPB				
Attitude to KPB via intention	.185	.051	<.001	.282
Norm to KPB via intention	-.010	.035	.767	-.019
PBC to KPB via intention	.109	.031	<.001	.232
T2 Submodel H2a- d (ii): Dropping Subjective Norm				
KPB				
Dropping Subjective Norm				
Attitude to KPB via intention	.179	.049	<.001	.272
PBC to KPB via intention	.107	.028	<.001	.227

5.15 Social Sciences Sample, Tests of the Mediating Role of Intention in the Relationships of Attitude, Subjective Norm and Perceived Behavioural Control with KPB constructs (KA, KS, KT)

Prior towards above model, this section describes the results from testing of the mediating effects of Intention in the Relationships of Attitude, Subjective Norm and Perceived Behavioural Control with three KPB constructs, i.e., knowledge acquisition, knowledge sharing and knowledge. Thus, results from these models address Hypotheses H2a-d, which proposed Attitude, Subjective norms and PBC has mediating effects on KPB Constructs; KA, KS and KT via Intentions.

5.15.1 Effects of mediating role Effects of mediating role of Intention in Attitude, Subjective Norm and Perceived Behavioural Control with KPB

A total of three hypotheses were estimated looking at the mediating effects of Intention in the Relationships of Attitude, Subjective Norm and Perceived Behavioural Control with KPB constructs (KA, KS, and KT). The results presented in Table 5.15.1.1 shows the mediating effect of Intention when effects of all behavioural component variables were included in the model. The results presented in the table shows that all T2 Sub-model H2a-d (i) indicate Intention components had significant effects in Attitude and PBC with KA, KS and KT with value of *p* less than.005, leaving only one behavioural component Subjective Norm had none significant effects with values less than .769. Subsequently, T2 Sub-model H2a-d (ii) dropped Subjective Norm, reported that again Attitude and PBC remained strongly statistically significant effects for all KA, KS and KT.

Table 5.15.1.1 Effects of mediating role of Intention in Attitude, Subjective Norm and Perceived Behavioural Control with KA, KS and KT

	Unstandardized Coefficient			***Standardized Coefficient***
Effects of Intention mediating role	***B***	***se***	***ρ***	***β***
T2 Submodel H2a- d (i)				
KA				
Attitude to KA via intention	.178	.051	<.001	.205
Norm to KA via intention	-.010	.033	.767	-.014
PBC to KA via intention	.104	.031	<.001	.169
KS				
Attitude to KS via intention	.178	.064	.005	.159
Norm to KS via intention	-.010	.034	.769	-.011

PBC to KS via intention	.105	.037	.004	.131
KT				
Attitude to KT via intention	.144	.040	<.001	.207
Norm to KT via intention	-.008	.027	.763	-.014
PBC to KT via intention	.085	.025	<.001	.170
T2 Submodel H2a- d (ii): Dropping Subjective Norm				
KA				
Dropping Subjective Norm				
Attitude to KA via intention	.171	.049	<.001	.198
PBC to KA via intention	.102	.029	<.001	.165
KS				
Dropping Subjective Norm				
Attitude to KS via intention	.172	.060	.004	.154
PBC to KS via intention	.103	.034	.002	.128
KT				
Dropping Subjective Norm				
Attitude to KT via intention	.139	.042	<.001	.199
PBC to KT via intention	.083	.025	<.001	.166

5.16 Social Sciences Sample, Tests of Hypotheses H3a and H3b: Relationships of Openness and Emotional Stability traits on Attitude

This section describes the results from testing structural equation models of the effects of the Big Five personality traits (Openness and Emotional Stability) on Attitude. Thus, results from these sub-models address T2 Hypotheses H3a-b, which proposed that Openness and Emotional Stability has positive direct relationships Attitude.

5.16.1 Hypothesis H3a and H3b, Effects of the Emotional Stability traits and Openness on Attitude

A T2 sub-model was estimated to specifically investigate the effects of the Big Five variables of Openness and Emotional Stability on Attitude, as proposed in Hypotheses H3a-b. The T2 sub-model result is a saturated model with a chi-square fit statistic of zero, with zero degrees of freedom. In T2 Sub-model H3a-b shows the overall significant effects of the two personality traits on Attitude. The results presented in the top portion of Table 5.16.1.1 indicate that only one variable had significant path coefficients on Attitude. More specifically, in this model only Openness were statistically significant effects for Attitude, with values of β= .125, p= <.001. Overall, T2 H3a-b explained a total of about 88% of the variance.

Table 5.16.1.1 Relationships of Emotional Stability traits and Openness on Attitude

		Unstandardized Coefficient		*Standardized Coefficient*
T2 Model	***B***	***se***	***ρ***	***β***
T2 Model H3a-b: Relationship of Emotional Stability traits and Openness on Attitude				
Attitude on				
Emotional Stability	-.036	.102	.723	-.033
Openness	.472	.125	<.001	.281
R^2 = .88				

5.17 Social Sciences Sample, Tests of Hypotheses T2 H4a-b and H5: Interactions of Traits and Behaviour on Intention

This section describes the results from testing structural equation models of the interaction effects of selected Big Five personality traits (Extraversion, Agreeableness and Conscientiousness) with the TPB variables of Subjective Norms and Perceived Behavioural Control on Intention. Thus, results from these models address T2 Hypotheses H4a-b and H5, which proposed that the relationship of subjective norms with intentions to engage in academic productivity behaviours is positively moderated by Extraversion (H4a) and Agreeableness (H4b) and the relationship of PBC with intentions to engage in KPB is positively moderated by Conscientiousness (H5).

5.17.1 Interactions of Traits and Behaviour on Intention

A model was estimated looking at the interactions of the Big Five and TPB variables on Intention. The T2 H4a-b and H5 Model is a saturated model because it allows all possible relationships amongst the set of variables. Thus, T2 H4a-b and H5 Model reported a chi-square fit statistic of zero, with zero degrees of freedom.

The results presented in the top portion of Table 5.17.1.1 indicate only one variable had significant path coefficients on Intention. T2 Model H4a included path from Extraversion, Norm and interactions from NormxExtraversion on Intention. The results indicate that only Norm with a value of β= .469, p= <.001had significant path coefficients on Intention and leaving interactions from Extraversion and NormxExtraversion on Intention non-significant. Overall, T2 H4a explained a total of about 23% of the variance.

In T2 Model H4b included path from Agreeableness, Norm and interactions from NormxExtraversion on Intention. Again, the results indicate that only Norm had significant path coefficients on Intention with a value of β= .461, p= <.001 and leaving remaining

Agreeableness and NormxExtraversion on Intention non-significant. Overall, T2 H4b explained a total of about 23% of the variance.

Subsequently T2 Model H5 included path from PBC, Conscientiousness, and interactions from PBCxCons on Intention. The results indicate that only PBC had significant path coefficients on Intention with a value of β= .598, p= <.001 and leaving remaining Conscientiousness and PBCxCons on Intention non-significant. Overall, T2 H4b explained a total of about 38% of the variance.

Table 5.17.1.1 Interactions of Big Five and TPB on Intention

		Unstandardized Coefficients		***Standardized Coefficients***
Hypothesis	***B***	***se***	***ρ***	***β***
Hypothesis T2 H4a: Interactions of Extraversion with Norm and Intentions				
Intention on				
Norm	.545	.106	<.001	.469
Extraversion	.117	.188	.533	.068
NormxEx	.085	.202	.675	.048
R^2 = .233				
Hypothesis T2 H4b: Interactions of Agreeableness with Norm and Intentions				
Intention on				
Norm	.536	.104	<.001	.461
Agreeableness	.102	.189	.589	.046
NormxAgree	-.192	.309	.534	-.064
R^2 = .232				
Hypothesis T2 H5: Interactions of Conscientiousness with PBC and Intentions				
Intention on				
PBC	.612	.084	<.001	.598
Conscientiousness	.216	.144	.135	.101
PBCxCons	-.233	.163	.153	-.111
R^2 = .383				

5.18 Summary of Results

Table 5.18.1 shows the summary of hypotheses testing (H1a-e and H2a-d) based on the estimation of Social Science sample. Information in the table below indicating that when all the Big Five variables were specified as predictors of all three KPB components, only one hypothesis was supported significantly predicted KPB which are h1a and leaving the rest not supported. Meanwhile, results reported similar with T1, in T2 results for Hypothesis of H2a-d testing of direct effects of the Theory of Planned Behaviour (TPB) to higher order KPB evidence that in this model only h2c hypotheses are not supported. The outcome indicates

that attitude and PBC significantly predicted behavioural intentions and behavioural intentions significantly predicted knowledge productivity behaviours and its elements; KA, KS and KT.

Information in Table 5.18.2 reported results of hypothesis H2b-d testing on mediating effects of the Theory of Planned Behaviour (TPB) to higher order KPB. Results reported that all hypotheses except H2c were supported in this sub-model, behavioural intentions significantly have a mediated effect on KPB, and attitude and PBC have mediated effect on Behavioural Intentions. In contrast, subjective norms do not intermediate any impacts for KPB's behavioural intentions.

Table 5.18.3 information reported results of Hypotheses H4a-b and H5, testing the interactions of the Big Five and TPB variables on Intention, which looking at the relationship of subjective norms with intentions to engage in academic productivity behaviours is positively moderated by Extraversion (H4a) and Agreeableness (H4b) and the relationship of PBC with intentions to engage in KPB is positively moderated by Conscientiousness (H5) however all the hypotheses reported were not supported. For full information please refer to Table 5.18.2.

Table 5.18.1 Summary of T2 Hypothesis Testing B5 variables regarding effects of KPB

	Statement of T2 hypotheses H1a-e (B5)	**Standardized effect**	**Results indicate for higher order KPB**
H1a	*Openness has a positive relationship with Knowledge Productivity Behaviour.*	.358	Supported
H1b	*Emotional stability has a positive relationship with Knowledge Productivity Behaviour.*	---	Not supported
H1c	*Extraversion has a positive relationship with Knowledge Productivity Behaviour.*	---	Not supported
H1d	*Agreeableness may have either positive or negative relationships with Knowledge Productivity Behaviour.*	---	Not supported
H1e	*Conscientiousness has a positive relationship with Knowledge Productivity Behaviour.*	---	Not supported
	Statement of T2 hypotheses H2a-d (TPB)	**Standardized effect**	**Results indicate for higher order KPB**
H2a	*Intention to engage in research activities has a direct, positive effect on Knowledge Productivity Behaviour.*	.554	Supported
H2b	*Attitude towards publishing/presenting has a positive, direct effect on behavioural intention*	.491	Supported

H2c	*Subjective Norms about academic productivity pressure (i.e., peer and superior) have a positive direct effect on behavioural intention.*	---	Not supported
H2d	*Perceived Behavioural Control towards capabilities in publishing has positive direct effects on behavioural intention.*	.410	Supported

Table 5.18.2 Summary of mediating effects of TPB variables and KPB

	Statement of T2 hypotheses H2b-d (mediating effects)	**Standardized effect**	**Results**
H2b	*Attitude towards publishing/presenting has a mediated effect on Knowledge Productivity Behaviour via behavioural intention.*	.272	Supported
H2c	*Subjective Norms about academic productivity pressure (i.e., peer and superior) have a mediated effect on Knowledge Productivity Behaviour via behavioural intention.*	---	Not supported
H2d	*Perceived Behavioural Control towards capabilities in publishing have a mediated effect on Knowledge Productivity Behaviour via behavioural intention.*	.227	Supported

Table 5.18.3 Summary of direct and indirect effects of Big Five and TPB variables

	Statement of T2 hypotheses H3-H5	**Standardized effect**	**Results**
H3a	*Openness is positively related to Attitude towards publishing/presenting.*	.281	Supported
H3b	*Emotional stability is positively related to Attitude towards publishing/presenting.*	---	Not supported
H4a	*The relationship of Subjective Norms with intentions to engage in academic productivity behaviours is positively moderated by Extraversion.*	---	Not supported
H4b	*The relationship of Subjective Norms with intentions to engage in academic productivity behaviours is positively moderated by Agreeableness.*	---	Not supported
H5	*Conscientiousness is positively related to Perceived Behavioural Control towards capabilities in publishing.*	---	Not supported

CHAPTER 6: QUALITATIVE METHODOLOGY AND RESULTS

6.0 Research Design & Procedure

This chapter presents the methodology and results from a supplementary qualitative data collection involving a set of semi-structured interviews that were conducted in order to further address research questions related to why academics are motivated or hindered from engaging in research and related knowledge transfer activities. The interview participants were academics from Malaysia Public University, at the Lecturer and Senior Lecturer levels. This small sample interview study was intended to add additional qualitative data to aid in the interpretation of the main study results. A second reason for conducting the interviews was to collect suggestions and recommendations from the interviewees to provide to the university's policy makers.

6.1 Ethical procedure

Because this study involved collecting participants' perceptions and opinions of their work activities and work settings, this made ethical issues around confidentiality, privacy and voluntariness inescapable. To address this prior to the collection of data, invitation letter was delivered personally to the participating respondents letter and consent form (see Appendix 1 for a copy). At the interview, respondents were told about the study and asked to provide a signed informed consent statement. All the collected data for this study were kept confidential as no individuals have been labelled or described in the final dissertation

6.2 Research Samples and Data Collection Procedures

In this study, the process of conducting an interview took approximately 2-3 weeks from beginning of fieldwork in June 2017. Participants were contacted through personal connections. Prior to conducting an interview, information pertaining to the research studies and consent letter were emailed. Interviews were conducted face to face in the participant's office. Most of the interviews were conducted in Malay language, only one interview was conducted in English. Each of the interview sessions take place in the private office and was audio recorded. The interviews' average duration was 10 minutes, with a range from 5 minutes to 27 minutes. All of the participants agreed that their interview be recorded and

transcribed into a written document for later data analysis. Based on the observation throughout the interview process, the respondents were active and helpful.

Twenty-four academic staff participated in the interviews, the respondents comprise of 10 females and 14 males with age ranging between 30 to 55 years old. Apart from that, 19 of the participants possess master's degrees while the remaining has PhD degrees. Participants included three academics from Science and Technology, and twenty-one academics from the Social Sciences. They were at different professional levels and varied in the extent to which they had substantial administrative duties: twelve held lecturer posts while twelve were senior lecturers. Seven out of the twenty-four held administrative duties. In the presentation of results, the interviewee positions and duties are noted as following: Lecturer (L), Senior Lecturer (SL), and higher management position (HM).

6.3 Semi-structured Interview Protocol

Interviews offer a person-centred account of how each individual relates and interacts with their cultural context. Interviews provide flexibility and more in-depth qualitative exploration by gathering evidence and information from the interviewee. Responses obtained are expressed subjectively can be much richer and not limited to specific answers or numerical terms, as might be the case with questionnaires (Kvale, 1996). In the current research, the researcher used a semi-structured interviewing method, the interviewer has a list of provided questions to be covered and works through them in a numeration and systematic way. Same questions are asked for every interviewee, however additional or follow up questions could be asked for further clarification (Cohen, Manion, & Morrison, 2000). The interview guide consisted of ten (10) in depth-questions regarding academics' knowledge productivity behaviour. These semi-structured interview questions were developed after consulting conceptually similar measures used in existing research and literatures (Zhang, 2014). Table 6.3 lists the questions that were asked of the participants during the interviews.

Table 6.3 Semi-structured questions.

No.	Questions
1.	Please introduce briefly about your position and the job scope of your position.
2.	Do you view research and publication to be an important part of your job? Why?
3.	What are the main factors that encourage you to conduct a research and publishing?

3.1	What is your expectation from the study that you conducted?
4.	Has your motivation and research/publication practices changed over the time? Can you please elaborate briefly about the changes?
4.1	Have you even been promoted to a different academic level? Did you notice any changes after the promotion?
5.	Please describe the serious difficulties that you had when conducting a research and publishing activities?
5.1	Do you consider that teaching is a hindrance for research and publication work? Why?
6.	What would help you to be more productive researcher?
7.	In your opinion, do your department encourages and guides the research and publication productivity? Why?
8.	What is your suggestion or advice for the university in improving the productivity of research and publication of the staff? Please justify.
9.	Do you think your institution should refocus toward more research and publication activities? Why?
10.	Do you consider yourself a successful researcher? Please specify.

6.4 Qualitative Data Analysis

In the first stage of the qualitative data analysis, the researcher transcribed the audio recordings from each of the interview sessions into a written document. Next, from the transcriptions the researcher identified the coding, the information in the interview and whole dataset were examined and organized by the researcher (Green et al., 2007) The data undergo the disassembling and reassembling process (Ezzy, 2002). In the second stage of the data analysis, the researcher identified the sets of categories from the descriptions and describes it into key aspects to compliment the study context. These core categories are group as Importance and motivation factors influencing research productivity, perceived changes over time related to research productivity, challenges to research productivity, factors perceived as being helpful to being a productive researcher and departmental support on research productivity. The transcripts were reviewed by the researcher according to the categories. Later, the transcripts were revised according to their categories and relationships, and revisited to ensure that stable sets of categories and relationships can be attained.

6.5 Interview Results

A full transcript of the interviews is provided for reference in Appendix 5. The following sections summarize participant responses on the focal interview topics, including illustrative quotations from the interview transcripts. The qualitative interview results are presented interleaved with evidence from the quantitative survey data collection, in order to point out similarities and differences in the information coming from the two different approaches.

6.6 Importance and Motivation Factors Influencing Research Productivity

This section examines participants' responses to three interview questions (i.e., Question 2, 3 from Table 6.6.1 and Question 3.1 from Table 6.6.3) asked to probe their perceptions of the importance of being engaged in research and publication productivity, as well as the factors which motivated them to do so.

A first point to note is that all interview participants agreed that research and publication productivity is an important aspect of academic positions. In addition, they provided a variety of explanations for why these are important. Fifty four percent of the lectures (senior lecturers (n = 9) and lecturers (n = 7)) mentioned more than one reason that research and publication are important, for example, indicating that research and publication are important for "career development and [to] enlighten our knowledge, job promotion and career development." Five lecturers (1 senior lecturer and 4 lecturers; 21%) responded that "as a requirement as a lecturer, it's our duty to carry research and publications activities." is the main factor. Each one (8.3%) of them mentioned that research "is an important path for being as academic (identity as academic)" and one senior lecturer mentioned "to develop professionalism".

A sampling of responses to Question 2 is provided in Table 6.6.1, to illustrate the interview study participants' views of the importance of research and publication.

Table 6.6.1 Importance of research and publication

Q2: Do you view research and publication to be an important part of your job? Why?	
Respondent	***Response***
#1 (SL)	Generally, yes. As a lecturer we need to have research and publication for career and indirectly can add up our knowledge.
#12 (HM & SL)	Obviously, especially to my academic part. As they enlighten me as an academic in the university.
#13 (L)	Yes it is important, as it can enhance your knowledge and for career development.
#20 (L)	Yes it is important, as an educator we need to have publication and involves in

	research activities.
#10 (SL)	In my opinion yes it is very important. As an academic it is important to have research and publications not only teaching as it enhance our knowledge and etc.

Note. L = Lecturer; SL = Senior Lecturer; HM = Higher Management

The responses to quantitative survey items from the T1 data collection described in an earlier chapter are generally in accord with the qualitative data on the perceived importance of research and publication. Both quantitative and qualitative data indicated that most of the lecturer agreed that research and publication productivity is important. This can be seen by identifying relevant individual survey items and determining what the average response to them was reported positively in TPB item ranging from 5.64 and KPB component 2.31 and above. Table 6.6.2; illustrate participants' views of the importance of research and publication.

Table 6.6.2 Quantitative survey items relevant to the importance of research and publication

Scale & General Content	***Item Wording & Response Scale***	***Mean Response***
Attitude: Career development	A4.The effect on my career of attending academic conference is … {*unbeneficial, beneficial*}.	6.08
	A2.The effect on my career of presenting and publishing peer-reviewed research papers is likely to be …{bad,good}.	5.79
	A1.I look forward to those aspects of my job that will allow me to present and publish peer-reviewed papers {disagree,agree}.	5.64
KA: Knowledge enlighten	KA2. I attended a professional conference to keep current with what is happening in my research areas.	2.31
	KA3. I spoke with researchers inside or outside of my institution to determine what is new in my area of expertise.	2.55
	KA4.I attended workshops or training to learn new research-related skills or content.	2.74

Note. Mean Response from Social Science data; KA, KS & KT response scale are as the followings; Not at all (1); 1-2 times this past 12 months (2); 1-2 times per semester (3); 1-2 times most months (4); 1-2 times most weeks (5).

Question 3 more directly probed participants' motivations for doing research and publishing, asking participants "*What are the main factors that motivate you to keep doing research and publishing?*" A variety of different motivational factors were mentioned, and many respondents mentioned more than one factor. Some of these were clearly related to career success and achievement desires: fourteen out of twenty-four lecturers (senior lecturers (n =

4) and lecturers (n = 10)) (58%), mentioned "requirement, promotion, performance appraisal and job tenure" and N=5 (21%) of the senior lecturers (3) and lecturers (2), mentioned being motivated by a desire to "upgrade skills and knowledge enlighten."

Other motivating factors that were mentioned appeared to be more intrinsic in nature. For example, N=2 (8.3%) of senior lecturers expressed that the main factor for them was "recognition." Other intrinsic factors mentioned were "self-development" (1 senior lecturer and 1 lecturer; 8.3%), "enjoyment in research and publications and sharing knowledge" (1 senior lecturer and 1 lecturer; 8.3%), and "self-satisfaction" (2 senior lecturers; 8.3%).

In addition, some of the motivations mentioned by the lecturers seemed strategic: Six (3 senior lecturers and 3 lecturers; 25%) lecturers specified being motivated by "financial, grant and budgets" and three mentioned (3 senior lecturer; 12.5%) enjoyment going to conference and meet new people (networking)," and (1 senior lecturer and 2 lecturers; 8.3%) mentioned capacity of lecturer and university requirement." Other motivations that were mentioned by single individual (1 lecturer; 4.2%) included "new findings," and "support from university."

A sampling of responses to Question 3 and 3.1 is provided in Table 6.6.3, to illustrate participants' views on research and publication motivation and expectation.

Table 6.6.3 research and publication motivation

Q3: What are the main factors that encourage you to conduct a research and publishing?	
Respondent	***Response***
#3 (HM &SL)	Research and publication is an important factor for me as from the point view of knowledge; I enjoy sharing my knowledge with others especially with others who have a high interest with my studies.
#10 (SL)	I enjoy exploring new things. It will give me satisfaction.
#11 (SL)	One of them is for job promotion, enhancement of knowledge and especially research that focuses on Malaysia case studies, which can give contribution back to the country development.
#12 (HM & SL)	Firstly, promotion itself. Secondly, is scholarship. Thirdly is recognition from others, to look good in term of the scholarship.
#16 (SL)	Main factor, to add our knowledge, especially in the teaching subject.
Q3.1: What do you expect to get from it?	
Respondent	***Response***
#4 (HM &SL)	By doing research and publication, things to expect from it are, firstly is to get confirmation (job confirmation), secondly, is to enhance our knowledge and skills in our field and expertise. Moreover, the findings that we get from our studies we can use and share it with our colleagues or with our students. Career development, additional knowledge and enhance self-esteem.
#8 (L)	Career development and additional knowledge and enhance my self-esteem.
#12 (HM & SL)	[With] more research and publication, we will look good in terms of our knowledge and ourselves as academics and be known more by others or get recognition from others.

#17 (L)	I'm hoping that from my research and publication, it will get accepted and understood from the readers and will benefits them. My research will get accepted by the experts in the fields. Moreover, get acknowledgment and recognition from the expertise and as added value and for networking.
#21 (L)	Our research is being appreciated and benefits to others, and we could share the knowledge with people.

Note. L = Lecturer; SL = Senior Lecturer; HM = Higher Management.

Question 3.1 more directly investigated participants' expectations about engaging in research and publication, asking "*What do you expect to get from it?*" In response, twenty one percent of lecturers (3 senior lecturers and 2 lecturers) mentioned their expectation was "career enhancement, promotion and development." Another twenty one percent of lecturers (1 senior lecturer and 4 lecturers) specified "upgrade knowledge competency." Five (3 senior lecturers and 2 lecturers) specified "self development." Another four senior lecturers (17%) mentioned "recognition from others." Two senior lecturers mentioned self satisfaction." One of them (4.2%) mentioned "new finding and input and feedback from others." One senior lecturer expressed that the main factors for them were "sharing finding and knowledge." One senior lecturer mentioned "publish [in a] hi-index journal. Other responses given by a single individual included four percent of senior lecturers mentioned "new ideas; research and publication suit needs." and "help in teaching and learning." Based on the qualitative data, it was discovered that several lecturers are motivated by the extrinsic factors such as promotion, performance appraisal, and job tenure. In contrast, six lecturers comprise of 1 senior lecturer and 5 lecturers mentioned that the motivation for their research is due to their personal needs, "able to give contribution back, benefits for others as references to others and student" not external incentives, which results of following question of their expectation indicated similar.

A sampling of quantitative responses to Question 3 and 3.1 is provided in Table 6.6.4 and Table 6.6.4.1, to illustrate participants' views on research and publication motivation and expectation. This can be seen by identifying relevant individual survey items and determining what the average response to them was reported positively in TPB item ranging from 5.18 and KPB component 2.05 and above.

Table 6.6.4 Quantitative survey items relevant to the research and publication motivation

Scale & General Content	***Item Wording & Response Scale***	***Mean Response***
Intention:	I7.Over the next year, I will participate in informal meetings, conferences, competitions or expositions related to my research areas {unlikely, likely}.	5.71
Conference and meet new people		
Validate research	I1. I intend to publish a minimum of one peer-reviewed paper within the next year {disagree,agree}.	5.49

PBC: Validate research	PBC6. My ability to publish at least one paper in a year is under my control {disagree,agree}.	5.18
KA: Upgrade skills and knowledge enlighten	KA2. I attended a professional conference to keep current with what is happening in my research areas.	2.31
	KA3. I spoke with researchers inside or outside of my institution to determine what is new in my area of expertise.	2.55
	KA4. I attended workshops or training to learn new research-related skills or content.	2.74
KS: Enjoyment in research and publications and sharing knowledge	KS2. I shared my research experiences with my colleagues/research partners.	3.02
	KS.3 I informed my colleagues about new ideas, methods and research skills.	2.90
	KS.4 I shared my research documents with my colleagues/research partners.	2.79
	KS5. I shared my expertise from my research training with my colleagues/research partners.	2.80
KT: Validate research	KT7. I had one or more papers article accepted.	2.05

Table 6.6.4.1 Research and publication motivation expectation

Scale & General Content	***Item Wording & Response Scale***	***Mean Response***
Intention Publish hi-index journal	I1.I intend to publish a minimum of one peer-reviewed paper within the next year {disagree,agree}.	5.49
	I2. I will make publishing at least one peer-reviewed paper a priority {disagree,agree}.	5.37
PBC Self development	PBC3.I have the resources, knowledge and ability to share my research knowledge with others {disagree,agree}.	4.92
	PBC5.I have the resources, knowledge, and ability to enhance my research skill {disagree,agree}.	5.42
Norm Recognition	N3.My Dean/ Head of Department/colleagues/ will view me more favourably if I publish at least one peer-reviewed paper next year {disagree,agree}.	5.46

Note. M=Social Science data, KA, KS & KT response scale are as the followings; Not at all (1); 1-2 times this past 12 months (2); 1-2 times per semester (3); 1-2 times most months (4); 1-2 times most weeks (5).

Both quantitative and qualitative data indicated answers on motivations for doing research and publishing. However qualitative data indicated that intrinsic and extrinsic factors play crucial roles in motivating the respondents. Intrinsic factors can be the act of enlighten knowledge whereas extrinsic factors comprise of career development, promotion, performance appraisal, and other aspects. Nevertheless, respondent further expressed that research and publication motivation based on their personal need by giving back contribution to the society which reported in quantitative data in particular at the Theory of Planned

Behaviour; Intention and PBC and KPB component; Knowledge Acquisition, Knowledge Sharing and Knowledge Transfer.

6.7 Perceived changes over time related to research productivity

This section examines the way in which participants responded to two questions (i.e., Question 4 from Table 6.7.1 and Question 4.1 from Table 6.7.3) investigating their perceptions of changes in research and publication activities over time and with promotion. In response, all participants discussed that challenges to research and publication productivity include changes in methodology, data analysis and writing, IT changes, software availability and attention to hi-index publication.

A sampling of responses to Question 4 is provided in Table 6.7.1, to illustrate participants' views on research and publication changes.

Table 6.7.1 Research and publication changes

Q4: Has your motivation and research/publication practices changed over the time? Can you please elaborate briefly about the changes?	
Respondent	***Response***
#9 (L)	Yes. It depends on the university requirements which sometimes require [one] to publish in high-index journals like *Scopus*. In addition to that, a lot of methodology has changed over time.
#7 (L)	I'd say so, yes. As we grow older my research has changed in terms of knowledge and skills especially in order for publication.
#11 (SL)	Yes, especially during process of data analysis. Today there is a lot of software availability and rapid changes of technology.
#14 (SL)	Yes definitely it changed. Nowadays it's about technology, analysis of data also has changed. Back days we have SPSS software, now SmartPLS and R-programming software to look into varies of variables.
#17 (SL)	Ten years ago, during that time in terms of resources, accessing was very limited, for example, the internet. But today there's a lot of resources available and sharing medium for research activities and all the processes involved are much more direct and fast, accessibility and supporting tools much more efficient. In term of experience, there's a lot of changes in content, methodology used, and I am sure in the next ten years there will be other changes. It's an evolving process.

Note. L = Lecturer; SL = Senior Lecturer; HM = Higher Management.

Question 4 probes participants' changes on research and publications "*Do you think your motivation and research, publication practices have changed over time? Could you describe the changes?*" A variety of different change factors were mentioned and many respondents mentioned more than one factor. Twenty one percent of lecturers (3 senior lecturers, 2 lecturers) mentioned "methodology, data analysis and writing style changes." Another twenty

one percent of lecturers (3 senior lecturers, 2 lecturers) mentioned "research and development changes." Four lecturers (2 senior lecturers, 2 lecturers; 13%) stated "IT changes, software availability." Eight percent of senior lecturers (n=2) mentioned "hi-index attention" and "research able to give impact to society." Three lecturers said "grant budget and allocation." Another two (1 lecturer and 1 senior lecturer) mentioned "peer influence." Two lecturers (8.3%) indicated "university requirement." Two specified (1 lecturer and 1 senior lecturer) "environment and surroundings." One lecturer (4.2%) mentioned "upgrade knowledge and skills." and one senior lecturer mentioned "more experience." and "current issues and topic chosen."

A sampling of responses to Question 4.1 is provided in Table 6.7.2, to illustrate participants' views on research and publication changes on different academic levels.

Table 6.7.2 Research and publication changes on different academic levels

Q4.1: Have you even been promoted to a different academic level? Did you notice any changes after the promotion?	
Respondent	***Response***
#2 (HM & SL)	Nothing changes, I still do my research, but in a slow phase as I have given administrative position in my faculty.
#7 (L)	If been promoted, I think the changes would be the way I do the research.
#9 (L)	If been promoted, the lecturer duty will be expand for example not only teaching but involve consultation and of course involves with research and publication activities.
#15 (SL)	Yes, sometimes changes in terms of the requirement in academic line (university). No, as a lecturer even we have been promoted research and publication should be the same or improves.
#21 (L)	No, as a lecturer even we have been promoted research and publication activities should be the same or improves.

Note. L = Lecturer; SL = Senior Lecturer; HM = Higher Management.

Question 4.1 more directly investigates participants' perceptions of changes, asking "*As or if you have promoted to different academic levels? And what were the changes?*" A variety of different change factors were mentioned. Twenty nine percent of lecturers (3 senior lecturers and 5 lecturers) mentioned their changes because of "more involvement in research and publication." Twenty five percent of lecturers (4 senior lecturers and 2 lecturers) mentioned "remain the same." Three (2 senior lecturers and 1 lecturer; 13%) mentioned of them specified "more responsibilities." Other response by two (1 senior lecturer and 1 lecturer; 8.3%) of them also mentioned "capacity of lecturer," "meet needs of society and shareholder" "university requirement" and "changes in teaching load." Other response by a single lecturer (4.2%) said "attending conference," "writing style changes," and "expand in networking." One senior lecturer indicated "grant application easier."

The responses to quantitative survey items from the T1 data collection described in an earlier chapter are generally in accord with the qualitative data on the perceived importance of research and publication. This can be seen by identifying relevant individual survey items and determining what the average response to them was reported positively in TPB item ranging from 4.91 and KPB component 2.31 and above. Table 6.7.3 illustrate participants' views on research and publication changes overtime and different academic levels.

Table 6.7.3 Quantitative survey items relevant to the research and publication changes

Scale & General Content	***Item Wording & Response Scale***	***Mean Response***
Norm: Peer influence	N1.Most of my departmental colleagues think I should publish at least one peer-reviewed paper per year{disagree,agree}.	5.59
	N2.Most academics at my level publish at least one peer-reviewed paper in a high-quality journal in a year. {disagree,agree}.	4.91
	N8.Most researchers in my discipline regularly publish articles in refereed journals {disagree,agree}.	5.24
	N9.Most researchers in my discipline regularly present at refereed conferences {disagree,agree}.	5.30
Current issues and topic chosen	N6.I am expected by my departmental colleagues to keep up with new trends in my research areas {disagree,agree}.	5.45
	N7.Keeping up with new knowledge by reading academic journals is expected of researchers in my research area {disagree,agree}.	6.02
KA: Methodology, data analysis and writing style changes	KA2.I attended a professional conference to keep current with what is happening in my research areas.	2.31
	KA4.I attended workshops or training to learn new research-related skills or content.	2.74

Table 6.7.3.1 Research and publication changes would be

Scale & General Content	***Item Wording & Response Scale***	***Mean Response***
PBC: Attending conferences	PBC7.I have the ability to present my work at an academic conference {unlike,likely}.	5.53
KA: Methodology, data analysis and writing style changes	KA2.I attended a professional conference to keep current with what is happening in my research areas.	2.31
	KA4.I attended workshops or training to learn new research-related skills or content.	2.74
Networking	KA3.I spoke with researchers inside or outside of my institution to determine what is new in my area of expertise.	2.55
KS: Networking	KS5.I shared my expertise from my research training with my colleagues/research partners.	2.80

Note. M=Social Science data, KA, KS & KT response scale are as the followings; Not at all (1); 1-2 times this past 12 months (2); 1-2 times per semester (3); 1-2 times most months (4); 1-2 times most weeks (5)

Both quantitative and qualitative data indicated their research and publication changes over time. Qualitative data indicated that variety of different change factors were mentioned by respondent. Nevertheless, both qualitative and quantitative data further expressed that research and publication changes is seen as a part of academic improvement and which reported in quantitative data in particular at the Theory of Planned Behaviour; PBC and KPB; Knowledge Acquisition and Knowledge Transfer.

6.8 Challenges to Research Productivity

This section examines participants' responses to two interview questions (i.e., Question 5 from Table 6.8.1 and 5.1 from Table 6.8.3) probing their perceived challenges to research and publication activities. Participants discussed that challenges on research and publication productivity include the availability of grant funding, respondent feedback and cooperation, and the hi-index journal and other publications' acceptance rates.

A sampling of responses to Question 5 is provided in Table 6.8.1, to illustrate participants' views of research and publication challenges.

Table 6.8.1 Research and publication challenges

Q5: Please describe the serious difficulties that you had when conducting a research and publishing activities?	
Respondent	***Response***
#2 (HM & SL)	Firstly, finding suitable method for my study. Secondly, if there is new method I need to learn. Thirdly, topic chosen. Fourthly, writing up process. And lastly, difficulties to get publish in core journal.
#15 (SL)	The main challenge is in terms of financial. Especially now, the fund allocation has been cut down and limit to compare with previous time. Maybe this happens because of government and university financial constraint. If we want to do it we have to use our own money, which is limitation to ourselves.
#19 (SL)	Firstly, the challenges are in terms of financial and secondly the process of getting the grant. It is hard to get the government grant, that's the main challenges.
#20 (L)	For research activities it will be hard to do it if we don't get the grant. The process of getting the grant and during data collection also seems hard for me. That's the challenges that I have faced. Personally no. Two of them; teach and research correlates and complement each other. In order for you to lecture and share knowledge you have to do research.
#21 (L)	Firstly, the challenges are in terms of financial grant and etc. Secondly, in my view we often doing research in team its hard doing it individually therefore

	the other challenges would be in terms of choosing and inviting team members its quite difficult as their might have other responsibilities to do.

Note. L = Lecturer; SL = Senior Lecturer; HM = Higher Management.

Question 5 probe participants' challenges factors "*What are challenges for you*" was asked, more than half of the lecturers (7 senior lecturers and 9 lecturers; 67%) in the interviews mentioned their challenges were because of "financial, fund and grant." Four senior lecturers and two lecturers (25%) stated "time allocation to finish the research." Twenty one percent of lecturers (4 senior lecturers and 1 lecturer) mentioned "respondent feedback and cooperation." Four of senior lecturers (17%) mentioned "publish in hi-index and publication acceptance rate." Seventeen percent of lecturers (1 senior lecturer and 3 lecturers) expressed that the main factors for them were "teaching classes." Two (1 senior lecturer and 1 lecturer; 8.3%) of them mentioned "capacity of lecturer." Two senior lecturers (8.3%) mentioned "methodology and writing." One senior lecturer (4.2%) stated "lack publication in my areas." One lecturer (4.2%) indicated "choosing team members."

In qualitative data reported that fifty percent of the lecturers consistent tend to be challenge by extrinsic factors such as financial, fund and grant. Nevertheless the rest responded in variety answers and more affected by intrinsic factors such as respondent feedback and cooperation, publish in hi-index and publication acceptance rate. This results also have been described in quantitative data such as in the Theory of Planned Behaviour; Attitude, PBC, Norm and Knowledge Transfer.

A sampling of quantitative responses to Question 5 is provided in Table 6.8.2, to illustrate participants' views of research and publication challenges. This can be seen by identifying relevant individual survey items and determining what the average response to them was reported positively in TPB item ranging from 5.18 and KPB component 1.98 and above. Table 6.8.2, illustrate participants' views of the importance of research and publication.

Table 6.8.2 Quantitative survey items relevant to research and publication challenges

Scale & General Content	***Item Wording & Response Scale***	***Mean Response***
Attitude: Publish in hi-index	A6.Publishing my paper in a high-quality journal is.. {unbenefitcial,beneficial}.	6.39
PBC: Publish in hi-index	PBC6.My ability to publish at least one paper in a year is under my control {disagree,agree}.	5.18
Norm: Team member	N5.Most researchers in my discipline (both in my department and at other universities) share their research knowledge with others {disagree,agree}.	5.33

KT: Publish in hi-index	KT3.I submitted one or more papers to an academic conference.	2.04
	KT4.I submitted one or more papers to a journal.	2.27
	KT6.I presented one or more papers at an academic conference.	1.98
	KT7.I had one or more papers article accepted.	2.05

Note. M=Social Science data, KA, KS & KT response scale are as the followings; Not at all (1); 1-2 times this past 12 months (2); 1-2 times per semester (3); 1-2 times most months (4); 1-2 times most weeks (5).

Both quantitative and qualitative data indicated their challenges. However qualitative data indicated that respondent challenges by grant, financial availability. Nevertheless, both qualitative and quantitative data further expressed that research and publication challenges is seen as a part of publication rate in hi-index journal affected by personal needs which reported in quantitative data in particular at the Theory of Planned Behaviour; Attitude; PBC and Norm and Knowledge Transfer.

A sampling of responses to Question 5.1 is provided in Table 6.8.3, to illustrate participants' views of teaching as a hindrance towards research and publication.

Table 6.8.3 Teaching as a hindrance towards research and publication

Q5.1: Do you consider that teaching is a hindrance for research and publication work? Why?	
Respondent	***Response***
#2 (HM & SL)	Personally no. Two of them; teach and research correlates and complement each other. In order for you to lecture and share knowledge you have to do research.
#15 (SL)	I don't find it as a hindrance. This is because as we do research, the output that we get from the study we can share together with the students. Sometimes during teaching and learning session we can come out a lot of ideas with the student.
#19 (SL)	If the teaching load is too much, it can affect the time and concentration on research and publication activities. But nevertheless we try to do it in one year period of time.
#20 (L)	Yes, because it require a lot of time to prepare for class doing marking, assessment, advisor for students and etc, especially if you have a lot of teaching load and involves in administration duties. It would be better if the teaching loads are being reduced
#21 (L)	No, I don't see teaching is an obstacle, again as I have mentioned earlier, as an academic doing research is one of our criteria.

Note. L = Lecturer; SL = Senior Lecturer; HM = Higher Management.

Question 5.1 more directly probe participants teaching challenges factors "*Do you consider that teaching is a hindrance for research and publication work? Why?*" fourteen of twenty four the lecturers (58%) stated as no, as teaching and learning correlates with teaching and learning. Twenty five percent of lecturers (2 senior lecturers and 4 lecturers) mentioned "yes,

if too much teaching load". Eight percent of lecturers (2 senior lecturers) mentioned "yes, by looking at the university context, either teaching or learning university or research university". Two lecturers (8.3%) stated "administrative duties are the hindrance not teaching and learning." One of senior lecturer (4.2%) also mentioned "yes, if research is being done not in your areas." Both quantitative and qualitative data indicated that most of the lecturer agreed that teaching is not a hindrance and this is reinforce in quantitative data by external variables analysis, resulting teaching is not a hindrance.

6.9 Factors perceived as being helpful to being a Productive Researcher

This section examines the factors perceived to be helpful to being a more productive researcher. In response, all participants discussed to be a productive researcher the factors are importance to have management support, responsible team members and peers influence and training, seminar and practice.

A sampling of responses to Question 6 is provided in Table 5.9.1, to illustrate participants' views on factors influence productive researcher.

Table 6.9.1 Factors perceived to help be more productive as a researcher

Q6: What would help you to be more productive researcher?	
Respondent	***Response***
#4 (HM & SL)	In my opinion, a lot of our researcher will try to apply the grant when they were motivated. What I mean by motivated and being productive is, the management of the university should support the research and publication activities on going for example held a workshop on research writing or any workshop regarding research and publication. Motivations through all the workshop or short courses will help the researcher to be more productive.
#11 (L)	Strengthen my knowledge in my research data, research analysis. I have to get closer with those who have the expert in the fields, so that I can learn the skill and way (process) in research and publication activities.
#18 (L)	Firstly, to have a responsible team members which can give ideas, inspiration and able to complete the research. Secondly, able to produce new knowledge where your research fit along the time meaning that able to solves recent issues.
#22 (L)	I would say getting my students involved with research activities as they will be able to get new input and me myself.
#24 (HM & SL)	As our country is moving towards being a developed country, thus we need to look into the context or opportunities that we have in order to help enhancement of our country and our universities. A lot of new areas which can be explored, so that it can help enhance our research quality and activities indirectly we can give contribution back to our country.

Note. L = Lecturer; SL = Senior Lecturer; HM = Higher Management.

Question 6 probes participants' perceptions of factors that influence them in becoming a more productive researcher "*What would help you to be more productive researcher?"* A

variety of different factors were mentioned, and many respondents mentioned more than one factor. Twenty nine percent of lecturers (3 senior lecturers and 4 lecturers) claimed that the significant factor for them was "grant availability." Twenty five percent of lecturers (2 senior lecturers and 4 lecturers) claimed that the significant factor for them was "management support." Twenty one percent of lecturers (2 senior lecturers and 3 lecturers) mentioned "responsible team members and peer influence." Seventeen percent of them (2 senior lecturer and 2 lecturers) also mentioned "facilities and resources." Other five of them (1 senior lecturer and 4 lecturers; 21%) stated "training, seminar and practice," three of lecturers (2 senior lecturer and 1 lecturer; 13%) specified "able to give contribution back." Eight percent of lecturers (1 senior lecturer and 1 lecturer) expressed that the main factors for them were "read a lot to strengthen my knowledge." Two (1 senior lecturer and 1 lecturer) specified "establish networking with expertise." and "new ideas and topic." Eight percent of senior lecturer, N=2 mentioned "able to publish." One senior lecturer stated "self-attitude," "time management," and "reduce teaching loads." One lecturer indicated "rewards" and "involvement with students."

As been predicted in quantitative data, both quantitative and qualitative data reported that most of the lecturers mentioned that factors influence in becoming productive researcher is inclined to be motivated by the intrinsic factors such as management support and responsible team members and peer influence. Most of the respondent expressed that they are affected by personal needs as reported in quantitative data such as in the Theory of Planned Behaviour; Norm, PBC and Knowledge Acquisition and Knowledge Sharing.

The responses to quantitative survey items from the T1 data collection described in an earlier chapter are generally in accord with the qualitative data on the perceived importance of research and publication. This can be seen by identifying relevant individual survey items and determining what the average response to them was reported positively in TPB item ranging from 5.20 and KPB component 2.05 and above. Table 6.9.2, to illustrate participants' views on factors influence productive researcher.

Table 6.9.2 Quantitative survey items relevant to the factors influence productive researcher

Scale & General Content	*Item Wording & Response Scale*	*Mean Response*
PBC: Publish in hi-index	PBC6.My ability to publish at least one paper in a year is under my control {disagree,agree}.	5.20
Norm: Team member	N5.Most researchers in my discipline (both in my department and at other universities) share their research knowledge with others {disagree,agree}.	5.34
KA: Training, seminar and practice, new ideas and topic	KA2.I attended a professional conference to keep current with what is happening in my research areas.	2.32
	KA3.I spoke with researchers inside or outside of my institution to determine what is new in my area of expertise.	2.62
Strengthen my knowledge	KA1.I read professional journals and similar sources to acquaint myself with new ideas that might be relevant to my research interests..	3.47
KS: Establish networking with expertise	KS5.I shared my expertise from my research training with my colleagues/research partners.	2.82
KT: Publish in hi-index	KT7. I had one or more papers article accepted.	2.05

Note. M=Social Science data, KA, KS & KT response scale are as the followings; Not at all (1); 1-2 times this past 12 months (2); 1-2 times per semester (3); 1-2 times most months (4); 1-2 times most weeks (5).

Both quantitative and qualitative data stated their factors influence research and publication. Qualitative data indicated that respondent tend to be influenced by extrinsic factors such as grant availability. Nevertheless, respondent further expressed that research and publication productivity affected by personal needs (Norm) which reported in quantitative data as well in particular at the Theory of Planned Behaviour; PBC and Norm and KPB components; Knowledge Acquisition, Knowledge Sharing and Knowledge Transfer.

6.10 Departmental support on Research Productivity

This section examines the influence of departmental support. Participants were asked whether they believed that departmental support would help them to be more productive. In response, all participants agreed their department shows support and is very much helping them in order to be more productive.

A sampling of responses to Question 7 is provided in Table 6.10.1, to illustrate participants' views on departmental support on research productivity.

Table 6.10.1 Departmental support on research productivity

Q7: In your opinion, do your department encourages and guides the research and publication productivity? Why?	
Respondent	***Response***
#3 (HM & SL)	Yes, obviously the university and the department are very much supportive in research and publication activities. Example as a Head of Faculty I encourage my staff to do research that related to their subject.
#5 (L)	Yes, because there are a lot of activities related to research and publication such as on writing and publish in high impact journals that have been conducted by the department.
#10 (SL)	Yes, in my department especially my Head of Faculty is very supportive. We always look for opportunities to collaborate with other department in and outside of university.
#12 (HM & SL)	Yes, we do have. For language programme, we have implementation of SIG-special interest group we promote and encourage each other to do research. For example, my focus is on communication, so those who have same interest will discuss together about grant and fund for research and publication activities.
#24 (HM & SL)	Yes, in my faculty context there are no issues in support and motivation context. Because we have our own KPI (Key Performance Indicator), which meets the KPI of university objective and quality. In my faculty, BM (Business Management) is the biggest faculty in UiTM Kedah, thus we need to give more contribution towards KPI and university objectives and quality. Activities that support research and publication are being held such as colloquium and seminar.

Note. L = Lecturer; SL = Senior Lecturer; HM = Higher Management.

Question 7 investigates participant's departmental support motivation factors. When the question "*department promotes and mentors faculty research and publication productivity*" was asked, 100 percent lecturers mentioned "yes." Twelve out of twenty-four lecturers (senior lecturers (n = 5 and lecturers (n = 7) (58%), mentioned "my Head of School shows support, encouragement and awareness and permit access for data collection." Five (2 senior lecturers and 3 lecturers; 21%) indicated "held knowledge sharing session, writing activities." Three of them (1 senior lecturers and 2 lecturers) stated "yes supportive, but lack of motivation and encouragement." Two lecturers (8.3%) said "research related to subject." One lecturer stated "award." Other response by a single senior lecturer (4.2%) mentioned "yes, but lack of research attitude among peers", "to achieve KPI (key performance indicator)", "yes as long as registered in *PJI* (UiTM-Research industry linkage)" and "SIG special interest group for discussion."

A surprising result from the quantitative data analyses was the finding that, in both the SS and ST samples, norms did not significantly predict intentions when PBC and attitude were also in the model, suggesting that they are not a major contributor in predicting research and publication productivity. It might be asked how this result fits with the qualitative data, which

suggest most of the respondents agree that their department promotes and mentors faculty research and publication productivity, and thus reflects positive norms towards this type of behaviour. One possibility is that in the current context, essentially all faculty members perceive positive norms for research and publication even though there might be individual differences in how strongly positive those norms are perceived to be, and there is a lack of negative normative influence that might discourage this type of behaviour.

A sampling of quantitative responses related to Question 7 is provided in Table 6.10.2, to illustrate the survey participants' views about the extent of departmental support for research productivity. This can be seen by identifying relevant individual survey items and determining what the average response to them was reported positively in TPB item ranging from 5.33 and KPB component 3.04 and above.

Table 6.10.2 Quantitative survey items relevant to the departmental support on research productivity

Scale & General Content	***Item Wording & Response Scale***	***Mean Response***
Norm: Management support, responsible team members and peer influence	N5.Most researchers in my discipline (both in my department and at other universities) share their research knowledge with others {disagree,agree}.	5.33
KS: Held knowledge sharing session	KS7. I sought colleagues out for advice on a project I was working currently.	3.04

Note. M=Social Science data, KA, KS & KT response scale are as the followings; Not at all (1); 1-2 times this past 12 months (2); 1-2 times per semester (3); 1-2 times most months (4); 1-2 times most weeks (5).

Qualitative data indicated that most of the lecturer agreed that their department shows strong support for research and publication activities such as "department promotes and mentors faculty research and publication productivity". Furthermore, supported in quantitative data in particular at the Theory of Planned Behaviour the individual item of *management support* (Norm; M=5.33) shows positive relations in research and publication productivity as an academic and affected by personal needs as well.

6.11 Suggestions from participants

This section examines participants' responses to two interview questions (i.e., Questions 8 from Table 6.11.1 and Question 9 from Table 6.11.3) asked in order to probe their opinions and suggestions for improving research productivity. Only one interview participant chose not to answer these questions, the rest of participants' answers were varied, including such suggesions as increasing the availability of grant, reducing teaching load and offering rewards.

A sampling of responses to Question 8 is provided in Table 6.11.1, to illustrate participants' suggestions for improvement on research and publication productivity.

Table 6.11.1 Suggestions for improvement on research and publication productivity

Q8: What is your suggestion or advice for the university in improving the productivity of research and publication of the staff? Please justify.	
Respondent	***Response***
#1 (SL)	In my opinion, I see that lecturers who have expertise in one field especially those with doctorate should lead the team in doing research and publication activities.
#4 (HM & SL)	In my opinion, firstly lecturers need to choose good responsible team members so that the entire task will be given equally and not dominant by one person where the others just give support. Next, the chosen topic of the research needs to be in core in their field so that they can produce quality research and output. Observation should be made in terms of chosen topic and team members. Members should consist in the same field. In addition, methodology, lecturers should equip themselves with methodology skills, they love to write but lack of methodology skills. Lecturers should go for a methodology courses and after fulfilling it only they university should offer the grant. Thus, I think by this time to complete the research are achieved, have experience after going to the methodology courses and quality of the research much more improved.
#10 (SL)	Yes, in my department especially my Head of Faculty is very supportive. We always look for opportunities to collaborate with other department in and outside of university.
#13 (L)	For improvement, I would say upgrade the facilities in order for lecturers can easily access to the resources. Give sufficient time to complete the research, reduce a little teaching load and increase grant availability.
#16 (HM & SL)	For me those lecturers who actively participate in research and publication should be given a little bit of incentive or rewards, not in terms of financially but it also can be in terms of career promotion and reduce teaching load because they are actively involved in research and publication activities.
#22 (L)	Motivation and awareness, I think the university need to give on going and repetitive motivation and encouragement in doing research and publication. That will boost their spirit in doing research and publication.

Note. L = Lecturer; SL = Senior Lecturer; HM = Higher Management.

Question 8 investigates participants' view about suggestions for university improvement "*Do you have any suggestions or advice for the university as to how it can improve the research*

and publication productivity of staff? Please specify". Nine out of twenty-four lecturers (senior lecturers (n = 6) and lecturers (n = 3)) (37.5%), mentioned their main factor were "increase fund, grant and budget allocation." Four lecturers (17%) stated "reduce teaching loads." Three (2 senior lecturers and 1 lecturers; 12.5%) stated "lecturer should go for training, workshop and have methodology skills." The other three (1 senior lecturers and 2 lecturers; 12.5%) mentioned "management should give on-going support motivation and encouragement." Two senior lecturers expressed that the main factors for them were "give rewards." The other two senior lecturer (8.3%) said "simplified grant and fund process." Two lecturers (8.3%) indicated "more facilities. Two (1 senior lecturer and 1 lecturer) mentioned "choosing the right topic."

Other response by a senior lecturer (4.2%) mentioned "UiTM press should give more research awareness to staff," "sabbatical leaves and study leaves," "expertise or doctorate should lead research team not administrative work," and "choosing the right team member." Another response by a lecturer (4.2%) specified "link between PJI and HoF," "hold colloquium" and stated "self promotion in website by listing all the publications." Only one lecturer mentioned "no comment."

In qualitative data reported that most of the respondent suggestion to be influence by extrinsic factors such as increase fund grant and budget allocation. In spite of that few of them stated that their suggestion for university improvement is more affected by intrinsic factors such as upgrading research knowledge and skills. This result also has been reported in quantitative data such as in the Knowledge Acquisition and Knowledge Sharing.

The responses to quantitative survey items from the T1 data collection described in an earlier chapter are generally in accord with the qualitative data on the perceived importance of research and publication. This can be seen by identifying relevant individual survey items and determining what the average response to them was reported positively in KPB item ranging from 2.32 and above. Table 6.11.2, to illustrate participants' suggestions for improvement on research and publication productivity.

Table 6.11.2 Quantitative survey items relevant to the suggestions for improvement on research and publication productivity

Scale & General Content	***Item Wording & Response Scale***	***Mean Response***
KA: Training and	KA2.I attended a professional conference to keep current with what is happening in my research areas.KA2.I	2.32

methodology skills	attended a professional conference to keep current with what is happening in my research areas.	2.73
	KA4.I attended workshops or training to learn new research-related skills or content.	3.12
KS: Colloquium	KS1.I share academic knowledge and research experiences through informal discussions.	

Note. M=Social Science data, KA, KS & KT response scale are as the followings; Not at all (1); 1-2 times this past 12 months (2); 1-2 times per semester (3); 1-2 times most months (4); 1-2 times most weeks (5).

Both quantitative and qualitative data reported relevant to the suggestions for improvement on research and publication productivity. Qualitative data indicated that respondent suggestion are in term of extrinsic factors such as more financial and grant availability. Nevertheless, respondent further expressed their suggestions on providing more training and methodology skills which reported in quantitative data in particular at the Knowledge Productivity Behaviour; Knowledge Acquisition and Knowledge Sharing.

A sampling of responses to Question 9 is provided in Table 6.11.3, to illustrate participants' views on institution research and publication focus.

Table 6.11.13 Institution research and publication focus

Q9: Do you think your institution should refocus toward more research and publication activities? Why?	
Respondent	***Response***
#4 (HM & SL)	Look at the mission of the university. In UiTM context, main campus in Shah Alam and Puncak Alam more focus on research activities. For campus branch we much focus on teaching and learning but attention to research also is needed but the weighted is different with the main campus.
#8 (L)	I'd say so, yes. If the university aims for research productivity, they should focus more on research activities and reduce teaching loads.
#11 (HM & L)	Yes it supposed to be, as we an academic institution. Lecturer should produce more quality research. For those who actively involves in research should be given less teaching load. Thus they not feel burden by teaching and research activities at the same time. Moreover, I see that the university have a planned focus in research and publication activities; as they plan to have four core or track and of them is research track, so that lecturer will be more focus in doing research and have less teaching load.
#16 (HM & SL)	Yes it should have focused but it needs to be balance between research publication and teaching learning activities.
#17 (SL)	Yes. As our university has listed in QS rank, in order to maintain or to improve on top we need to focus on research and publication activities. I think a little more focus on research and publication can be done even though we are currently teaching and learning university.

Note. L = Lecturer; SL = Senior Lecturer; HM = Higher Management.

Question 9 more directly investigates participants' point of view about university research direction "*Do you think your institution should refocus toward more research and publication*

activities? Why?" Was asked, thirty eight percent of lecturers (6 senior lecturers and 3 lecturers) suggests "yes, for improvement in university world ranking" another thirty eight percent of lecturers (5 senior lecturers and 4 lecturers) mentioned "it depends on nature, objectives and mission of the university itself." Three lecturers (12.5%) specified "yes, if we are targeting for Research University." One lecturer suggested "yes, research and publication should work together with teaching and learning." One lecturer (4.2%) mentioned "yes, to increase KPI (key performance indicator)." Only one senior lecturer said "yes, research, publication teaching and learning activities should be balance."

6.12 Successful researcher

In this last section examines whether participants view themselves as successful researchers. In response, only one (lecturer) chose not to answer, and only one (senior lecturer) mentioned "yes." Half of the participants mentioned "not yet" as their answer, then again "in a process of growing into successful researcher" and one answered "moderate researcher". This suggests that although many of these individuals do not yet see themselves as completely successful researchers, they are at an intermediate state where they are striving to improve. From an institutional point of view, this represents a positive opportunity suggesting that interventions which could help these individuals develop more would be desirable and more likely to be successful.

A sampling of responses to Question 10 is provided in Table 6.12.1, to illustrate participants' view themselves as a successful researcher.

Table 6.12.1 Successful researcher

Q10: Do you consider yourself a successful researcher? Please specify.	
Respondent	***Response***
#2 (HM & SL)	I am not so sure if I can comment on that, I will let others judge on that, to me -- maybe a moderate researcher.
#5 (L)	Not yet, since I just published in few journals.
#12 (HM & SL)	Moving towards it. I got few research grants from the university one of them almost RM85, 000 grant, and now I'm still learning and keep myself moving. Maybe one day I will take research as my priority in my academic line.
#17 (SL)	No, but aspiring yes.
#18 (L)	No I don't think so, because right now I have other duties as an auditor and also teaching and learning activities. Therefore I have limited time
#24 (HM & SL)	Looking at my context as the deputy rector, my involvement in research and publication is limited. But looking at my twenty-two year career after finishing my PhD, I am involved in research and publication. But still now the involvement is there but it is limited, it is not as team leader but a part of research team. I have been through all the phase, I can see myself as

successful researcher but not victorious or great.

Note. L = Lecturer; SL = Senior Lecturer; HM = Higher Management.

Finally question 10 investigates participants' described themselves as a successful researcher "*Do you consider yourself a successful researcher? Please specify*" was asked, half of the participants answered the questions as "not yet". Seven of them (2 senior lecturers and 5 lecturers; 29.2%) percent of lecturers mentioned "maybe one day." Two senior lecturers (8.3%) stated "I still have a lot of things to learn." Two lecturers (8.3%) stated "I only publish a few journals." Other response by a single senior lecturer (4.2%) mentioned "in a process of growing into successful researcher," "close to successful researcher," "my research is not being used by others," "I'm trying to be success researcher not only in my field but in other field," "I see myself as a lecturer than a researcher," "as an inspiring researcher," and "moderate researcher." ." Other response by a single senior lecturer (4.2%) mentioned "right now I'm focusing in teaching and learning," "I have other duties," and "no comment."

In qualitative data reported that most of the respondent expressed themselves as a successful researcher by looking upon their number of publication. This result could best be described in quantitative data such as in the following items such as Knowledge Transfer responses where respondent are asked about their overall publication activities.

A sampling of quantitative responses to Question 10 is provided in Table 6.12.2, to illustrate participants' view themselves as a successful researcher. This can be seen by identifying relevant individual survey items and determining what the average response to them was reported positively in KPB item ranging from 1.98 and above.

Table 6.12.2 Quantitative survey items relevant to successful researcher

Scale & General Content	***Item Wording & Response Scale***	***Mean Response***
KT: Publication activity	KT2.I worked on one or more books or book chapters reporting my research findings.	2.52
	KT5.I revised one or more papers that have received a journal review.	2.09
	KT6.I presented one or more papers at an academic conference.	1.98
	KT7.I had one or more papers article accepted.	2.05

Note. M=Social Science data, KA, KS & KT response scale are as the followings; Not at all (1); 1-2 times this past 12 months (2); 1-2 times per semester (3); 1-2 times most months (4); 1-2 times most weeks (5).

Qualitative data indicated their opinion regarding themselves as a successful researcher. Fifty percent of the respondent noted themselves as not yet. Nevertheless, respondent further expressed that could be seen as positive as they acknowledge themselves are heading to be a successful researcher one day, supported in quantitative data in particular at the Knowledge Productivity Behaviour; Knowledge Transfer in term of publication activity with range scale from 1.98 and above.

6.13 Conclusion

Overall in this study incorporates qualitative and quantitative techniques were being conducted to determine the factors of Academics knowledge productivity. There is an implication with the results from both studies which individual differences factors such as personality traits and attitudinal components do influence the impact of Knowledge Productivity Behaviour (KPB) of academicians.

To summarize the study, it seems that there are too many individual and motivation factors that affect academics knowledge productivity. Looking upon this study, signify that respondent tend to be motivated by both intrinsic and extrinsic factors. Moreover, as been reported in qualitative data most of the respondents agree that their department support is important in research and publication productivity which is contradicting with quantitative data, but again this is may due to variables correlated amongst themselves to some extent, it was possible that there was enough shared variance to hide otherwise significant effects. Nevertheless, most of the respondent expressed that their research and publication productivity also are affected by personal needs which have been reported in quantitative data in particular at the Theory of Planned Behaviour and KPB constructs.

This study aims to attain better understanding from the university administrators to know the real needs of the academic staff. Furthermore, this study aims to clarify to the university administrator and/or policy makers to consider the views given by the academic staff from various levels. Through providing more research opportunities which can cater the needs of faculty members and how they might increase their success at research and generate high publication outputs. In particular, for faculty members by recognizing their individual and motivators needs it will help them to demonstrate and one should have their aims and targets to strive towards success rate in their knowledge productivity.

CHAPTER 7: DISCUSSION AND CONCLUSION

7.0 Introduction

In this study the author has presented the results of a primarily quantitative study of the factors that contribute to the knowledge productivity (i.e., knowledge acquisition, knowledge sharing and knowledge transfer activities) of academic staff in the context of a large Malaysian university system. The study draws from literature on the Big Five personality factors and the Theory of Planned Behaviour to develop conceptual arguments for why and how key variables within these theories are expected to relate to knowledge productivity, as indicated in the model presented in Chapter 2 and reproduced again below. As will be discussed further in this chapter, the results supported many of the proposed relationships, but not others. These results come from two large survey samples, one of which includes a follow-up data collection approximately a year after the main data collection. Results from a supplementary qualitative data collection involving a set of structured interviews were also presented in order to further address research questions. As far as known, this study is the first to investigate both the Big Five model variables in antecedent and moderating roles, and the Theory of Planned Behaviour variables in mediating roles in the academic knowledge productivity context.

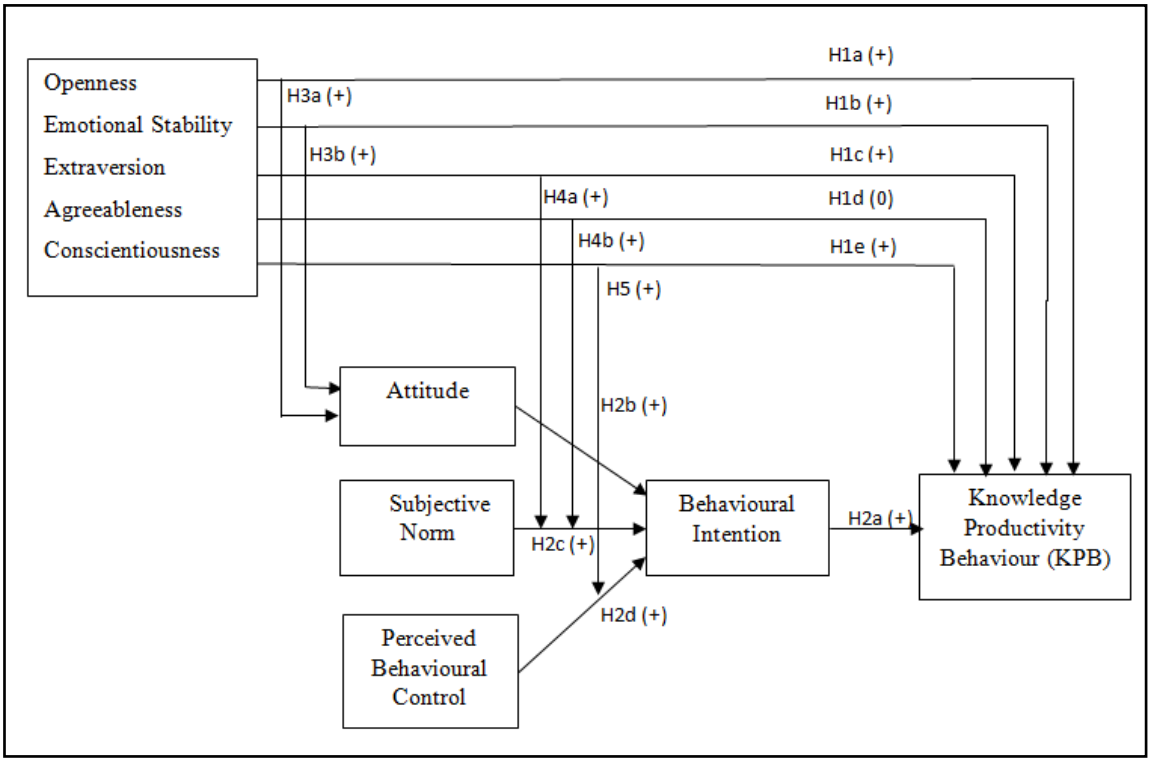


Figure 5: Model of Hypothesized Links between Personality, Theory of Planned Behavior components, and Knowledge Productivity.

This chapter combines the results that had been outlined in Chapter 5 and Chapter 6 in order to attain an extensive discussion on the findings. While quantitative results provide confirming evidence for a number of the hypothesized relationships between the predictors and academic knowledge productivity, none of the demographic and related control variables were found to have significant effects on academic knowledge productivity, thus they will not be further discussed. Finally, the qualitative data are integrated with the quantitative results in order to provide a better explanation and to further contribute to the understanding on academic knowledge productivity.

This study argues that it is possible that personality may related to attitude, norm and perceived behavioural control, and may influence academic knowledge productivity. A broad question that might be raised with respect to the model is whether the personality variables – which are regarded by some as relatively unchangeable – can be expected to explain variability in the TPB mediators and ultimately in knowledge productivity, and does this model imply that people cannot change to become more productive? The issue of personality stabilization across adulthood has been researched extensively. For example, Costa and McCrae (1994) claimed that personal qualities are set after the age of 30. However, Bleidorn (2012) highlights considerable evidence of personality change supported by previous works (Josefsson et al., 2013; Klimstra, Bleidorn, Asendorpf, van Aken, & Denissen, 2013; Wortman, Lucas, & Donnellan, 2012; Mõttus, Johnson, & Deary, 2012; Parker, Lüdtke, Trautwein, & Roberts, 2012; Sneed & Pimontel, 2012; Specht, Egloff, & Schmukle, 2011; Löckenhoff, Terracciano, Patriciu, Eaton, & Costa, 2009; Neyer & Lehnart, 2007; Van Aken, Denissen, Branje, Dubas, & Goossens, 2006; Pullmann, Raudsepp, & Allik, 2006; De Fruyt et al., 2006; Terracciano, McCrae, Brant, & Costa, 2005; Robins, Fraley, Roberts, & Trzesniewski, 2001).

Although the personality traits in adulthood is referred to the Big Five personality traits,of Extraversion, Neuroticism, Openness, Agreeableness and Conscientiousness is characterized by considerable stability, recent studies have indicated that people change their levels of Big Five traits across their life span, even in adulthood (e.g., Roberts, Walton, & Viechtbauer, 2006). There is also evidence for change in personality traits even in mid- and later life (e.g., Kandler, Kornadt, Hagemeyer, & Neyer, 2015; Roberts & DelVecchio, 2000; Roberts,

Walton, & Viechtbauer, 2006; Specht, Egloff, & Schmukle, 2011). It is assumed that besides physiological maturation processes, personality changes throughout the entire life span as a function of a person's interaction with environmental affordances and demands (i.e., the plasticity principle; Roberts, Wood, & Smith, 2005).

For example, Roberts, Walton, and Viechtbauer's (2006) meta-analytic study suggests that over the time, patterns of personality traits have changed as people are more socially dominant, conscientious, and emotionally stable throughout their lives. Robert et al. explained that the time of being a young adulthood is the primary period of mean-level personality trait development. This is proven that the flexibility of personality traits after 30 has gone to more specific traits such as social vitality, agreeableness, conscientiousness, and openness to experience. This indicated that the development of personality traits go along with the phenomenon of adulthood. In simpler word, visible pattern of normative can be seen after the age of 30 and continues doing so until the old age (Roberts, Walton, & Viechtbauer, 2005).

According to Roberts & DelVecchio, (2000), at the age of 30, personality development process will slow down but the personality of a person can still change due to the changes in life circumstances and the transition period (i.e. Specht et al., 2014; Specht, Egloff, & Schmukle, 2011). Robert Wood, & Smith, (2005) strengthen that each new life circumstances and transition period involve different series of norms and expectations that an individual must try to adjust. One of the hypothesized reasons behind these changes is due to the repeated reinforcement of norms and individual's adjustment to these norms. Although the method and extents of the changes are being discussed, the personality traits of todays are considered to be adaptable to the new environment.

These findings evidence that personality traits can change and adapt. TPB plays a role in explaining or mediating the information which external variables influence the intention or behaviour of a person. In fact, personality can be an external construct for which TPB plays a vital mediating role (Ajzen, 1988). This was supported by Chatzisarantis and Hagger (2008) who had claimed that the theory of planned behaviour does not capture all the variance in their outcomes that related to antecedent variables and that the personality traits may improve the analytical validity of the model.

In continuation of the reasoning above, the current study provides evidence that a comprehensive set of personality traits (i.e., the Big Five), in combination with the theory of planned behaviour, predict a very substantial amount of the variance in academic knowledge productivity behaviour.

Furthermore, recognizing and working with individual differences creates good management. However, it is imperative to recognize these factors as it affect the productivity of the academic staff knowledge.

7.1 Discussion of T1 and T2 Social Science Sample Results

The social science sample results include cross-sectional (Time 1) data relevant to the full model, as well as a follow-up measurement (Time 2) of the knowledge productivity variables that occurred approximately a year following the initial data collection. The Time 2 data were collected in order to provide a stronger test of the predictive relationships of the personality and TPB variables with knowledge productivity.

7.1.1 Summary of Findings for the Big Five Antecedent and Moderator Effects

The Big Five personality variables were hypothesised as independent variables used to predict knowledge productivity behaviour. The first step in investigating the relationships of the Big Five personality variables with other variables in the model focused specifically on the relationships of these variables with the KPB variables, ignoring any potential mediating effects of the Theory of Planned Behaviour variables. With Time 1 data, this involved the estimation of all possible relationships among the set of five personality variables and the KPB variables in two sets of sub-models. One set of models treated knowledge productivity behaviours as a single, higher-order latent construct, the other set treated the KPB as three separate outcomes (i.e., knowledge acquisition, knowledge sharing and knowledge transfer). A similar set of models was estimated using Time 1 Big Five data and Time 2 KPB data.

Going across the Time 1 social science models, consistent support was found for a positive effect of Openness on KPB. The path coefficients were positive, strong, and statistically significant for the effects of Openness on the higher order KPB construct, as well as for effects on each of the three KPB component variables. These findings are consistent with the

Time 2 social science models, the results reported were positive and statistically significant for Openness on KPB construct, and on each of the three KPB component; KA, KS and KT.

In this study, the finding has shown that Openness is proven to success in academic knowledge productivity behaviour. The nature of openness in knowledge productivity behaviour related to creative imagination and embraces to new idea and thing at workplace. As academics, individuals with high degree of openness are likely involved in contributing to and seeking knowledge. It seems that academics that tend towards Openness (i.e. show curiosity, innovativeness, generate and embrace new ideas) perform stand out and are much creative than those who are lower in Openness. This result confirms the finding of many past researcher as well Costa & McCrae, (1992), Peterson et. al. (2003), Lepine (2003), Matzler et al. (2008) and Colbert et. al., (2012). The significant relationship between Openness academic knowledge productivity behaviour could be explained by the fact that employees continuously have to adapt to changes in the workplace (Raudsepp, 1990).

Next in the Time 1 social science models, there was also consistent support for a positive effect of Extraversion on both the higher order KPB construct and all of its components. This effect was (as hypothesized) also positive in sign. However, it was not as strong an effect as was found for Openness. Conversely, these findings were not consistent with the Time 2 social science models, the results reported Extraversion were not statistically on both KPB construct, and on each of the three KPB component; Knowledge Acquisition, Knowledge Sharing and Knowledge Transfer.

In Time 1 the finding has shown that Extraversion is proven to contribute in academic knowledge productivity behaviour. The trait of Extraversion in knowledge productivity behaviour involves social ability, active and energetic at workplace. As academics, individuals posit high degree of extraversion is likely participating actively in knowledge productivity and play as effective team member (Mohammed & Angell, 2003; Taggar, 2002). In contrast, in Time 2 reported that Extraversion is not a valid predictor of knowledge productivity behaviour. A possible explanation for the contradictory results regarding the relationship between Extraversion and knowledge productivity behaviour is that possibility individual with Extraversion personality may play as effective team member however may be lack in term of work execution and performance.

Emotional Stability was also hypothesized to have a positive effect on KPB, but both results reported in the Time 1 and Time 2 social science results were not supportive of this hypothesis. The only statistically significant path found in Time 1 for Emotional Stability was in the prediction of Knowledge Transfer, and the sign of this weak path was negative.

This study reported that Emotional Stability showed that no practically significant relationships existed on knowledge productivity behaviour. A possible explanation for the results regarding the relationship between Emotional Stability and knowledge productivity behaviour is that possibility individual with Emotional Stability traits able to face stressful situations (Hough et al., 1990), however, Emotional Stability do not predicts knowledge productivity behaviour due to certain circumstances as in various occupations.

Furthermore, Conscientiousness traits as well were hypothesized to have a positive effect on KPB, however the hypothesized were not supported neither both in Time 1 and T2. Although there was a statistically significant effect of Conscientiousness on Time 2 Knowledge Sharing, it was weak.

Past research has shown that Conscientiousness is a significant predictor of job performance for a wide range of professions (Barrick & Mount, 1991; Schmidt & Hunter, 1998; Dudley et al., 2006). However, in this study Conscientiousness is not a valid predictor of knowledge productivity behaviour. A possible explanation for the contradictory results regarding the relationship between Conscientiousness and knowledge productivity behaviour is that fastidiousness, compulsive neatness, or workaholic behaviour were affected by the trait of high conscientiousness (Rothmann & Coetzer, 2003).

Finally, in the literature review developing conceptual arguments for the expected effects of Agreeableness on KPB, it was noted that there were potential reasons to expect both positive and negative effects of this variable, and that such effects might even cancel each other out so that the observed relationship was zero. Time 1 results from the social science are helpful in clarifying what the relationship in fact is. A statistically significant, moderate-sized and negative effect of Agreeableness was found on the higher order KPB construct, and on two of the three KPB components (i.e., Knowledge Acquisition and Knowledge Transfer).

Meanwhile, in time 2 results from the social science there is no statistically significant effect of Agreeableness on the higher order KPB construct, as well as on KPB components (i.e., Knowledge Acquisition, Knowledge Sharing and Knowledge Transfer).

In Time 1 the finding has shown that Agreeableness is proven to contribute in academic knowledge productivity behaviour. The trait of Agreeableness was found in Time 1 were reported as negative effects. A possible explanation for the this results regarding the relationship between Agreeableness and knowledge productivity behaviour is that possibility, in order to create new knowledge, individuals may need to take a stand against existing knowledge and ideas, which might be difficult for highly agreeable persons. In contrast, in Time 2 reported that Agreeableness is not a valid predictor of knowledge productivity behaviour due to certain occupations such as Agreeableness are found success towards customer service field (Judge et al., 1999).

In sum, the results generally support the hypotheses for Openness, however the hypothesis for Conscientiousness and Emotional Stability reported no correlations and not statistically significant with KPB. This result is interesting because we expected knowledge productivity behaviour to relate positively to Conscientiousness because academics may view research productivity as a requirement of their positions and Emotional Stability as knowledge productivity behaviour requires logical and rationale behaviour, and often involves complex problems that need persistence and optimism to be solved.

7.1.1.1 Summary of Findings for the relationships of Big Five and Theory of Planned Behaviour

Moreover, going across relationships of B5 with TPB in the Time 1 social science models, there was also consistent support for a positive effect of Openness on Attitude. This effect was (as hypothesized H3a and H3b) also positive in sign, the results reported were positive and statistically significant for Openness. These findings were consistent with the Time 2 social science models, the results reported were statistically significant for Openness on Attitude.

Next Emotional Stability was also hypothesized to have a positive effect on Attitude, but results reported in the Time 1 social science reported were not supportive of this hypothesis. This finding was consistent again in Time 2 social science study Emotional Stability did not have any effects on Attitude.

In this sub section, the results generally support the hypotheses for Openness, however the hypothesis for Emotional Stability reported no correlations and not statistically significant with Attitude. This result is expected because Openness engages in positive thinking, creativity and was found as a strong predictor toward knowledge productivity behaviour. However, Emotional Stability do not significant with Attitude yet again this is interesting as we expected academic with high Emotional Stability will have more positive attitudes engaging in the knowledge productivity behaviours. However, results shows that Emotional Stability were not statistically significant effects for Attitude were consistent with prior correlations results show a none positive correlation between Attitude and Emotional Stability.

7.1.1.2 Summary of Findings for Big Five (Moderator) Interactions Effects with TPB

Furthermore in this sub-section, shows results of testing B5 moderator effects of selected Big Five personality traits (Extraversion, Agreeableness and Conscientiousness) with the TPB variables of Subjective Norms and Perceived Behavioural Control on Intention.

In Time 1 Hypothesis 4a included path from Extraversion, Norm and interactions from NormxExtraversion on Intention. The results indicate that Norm and Extraversion had significant path coefficients on Intention however interactions from NormxExtraversion on Intention are reported non-significant. Meanwhile in Time 2, the results indicate that only Norm had significant path coefficients on Intention and leaving Extraversion and NormxExtraversion on Intention non-significant. Therefore this hypothesis was not supported for both Time 1 and Time 2.

Next, results reported both in Time 1 and Time 2 is similar. Hypothesis 4b included path from Agreeableness, Norm and interactions from NormxExtraversion on Intention. The results indicate only Norm had significant path coefficients on Intention, leaving effects for

Agreeableness and NormxExtraversion on Intention non-significant. As a result this hypothesis was not supported for both Time 1 and Time 2.

Finally, yet again results reported both in Time 1 and Time 2 is identical. Hypothesis H5 included path from Conscientiousness, PBC interactions from PBCxConscientiousness on Intention. The results indicate only PBC had significant path coefficients on Intention. More specifically, in this model there were statistically significant effect for PBC, leaving Conscientiousness and PBCxConscientiousness had non-significant interactions on Intention. Thus this hypothesis was not supported for both Time 1 and Time 2.

Finally, this study also tested (Time 1 and Time 2) the interaction effects of selected Big Five personality traits (Extraversion, Agreeableness and Conscientiousness) with the TPB variables of Subjective Norms and Perceived Behavioural Control on Intention. This result is interesting since they are many past literature shows the personality traits to be positively related to behaviour (e.g., Hirsh, 2010; Hirsh & Dolderman, 2007; Korotkov, 2008; Markowitz, Goldberg, Ashton, & Lee, 2012). This finding is support by recent literature by Shropshire, Warkentin and Sharma (2015), in their study noted that various personality traits are suggested as possible moderators of the intention-behaviour relationship. We expected that individuals higher in personality traits will be more knowledgeable of subjective norms, and that this knowledge will more strongly influence their intentions engaging in academic productivity behaviours. Nonetheless, these results indicate all of these hypotheses are not supported. These findings are consistent with the H2c results, which suggests that subjective norms, does not predicting and intentions.

7.1.2 Summary of Findings for the Theory of Planned Behaviour Effects

This section describes the results from testing structural equation models of the effects of the Theory of Planned Behaviour (TPB) to higher order KPB (Knowledge Productivity Behaviour) construct, as well as the three KPB elements, i.e., knowledge acquisition, knowledge sharing and knowledge transfer. The Theory of Planned Behaviour as predictor variables was hypothesised to predict knowledge productivity behaviour as well as the three KPB elements, i.e., Knowledge Acquisition, Knowledge Sharing and Knowledge Transfer. The Theory of Planned Behaviour variables were treated as predictor variables and the higher order KPB variable as outcomes, or the set of three KPB component variables as shown in

illustrative Figure 4.16. As well as testing the hypothesis within each of the different sets of predictors, the results from these models address Hypotheses H2a-d, which proposed that Intention, has positive direct relationships with KPB and the effects of Attitude, Subjective norms and PBC has mediating effects on KPB via Intentions. With Time 1 data, one set of models treated knowledge productivity behaviours as a single, higher-order latent construct; the other set treated the KPB as three separate outcomes (i.e. KPB elements). A similar set of models was estimated using Time 2 data.

Going across the Time 1 and Time 2 social science models, both data reported identical results. Intention component shows significant path coefficients with KPB. The path coefficients were positive, strong, and statistically significant for the effects of Intention on KPB, as well as for KPB construct KA; KS and KT.

Next both results in Time 1 and Time 2 social science models, the remaining two of TPB variables; Attitude and PBC shows strong significant effects on Intention. The path coefficients were positive, strong, and statistically significant for the effects of Intention on KPB, as well as for KPB construct KA; KS and KT.

Furthermore both results in Time 1 and Time 2 social science models, reported that Subjective Norm had none significant path coefficients on KPB, as well as for KPB construct KA; KS and KT.

In addition, relationships amongst the Theory of Planned Behaviour Variables and KPB were also estimated in this study. As was reported in this study, all four of the TPB variables, i.e., Attitude, Norm Perceived Behavioural Control and Intention, have strong, positive, and statistically significant relationships with each other. However, Subjective Norms did not predict behavioural intentions for KPB. We expected knowledge productivity behaviour to relate positively to Subjective Norm as encouragement from outside sources will influence intentions for KPB. Since the Theory of Planned Behaviour variables correlated amongst themselves to some extent, it was possible that there was enough shared variance to hide otherwise significant effects this could be seen in the strong relationship between PBC with other remaining predictors.

7.2 Discussion of T1 Science Technology Sample Results

Generally in this study, each potential relationship among the set of Big Five personality, TPB variables and KPB were estimated. Several of the results do support the proposed hypotheses, however in H1a-e only Extraversion, Agreeableness and Openness shows statistically significant with KPB. This result is interesting we expected knowledge productivity behaviour to relate positively to other traits as well given that numerous studies have investigated the relation between the Big Five personality factors and academic performance (Chamorro-Premuzic & Furnham, 2008). However, results shows that only Extraversion, Agreeableness and Openness significantly predicting KPB behaviour were consistent with prior correlations results from measurement model which reported positive correlation between Extraversion, Agreeableness and Openness and KPB.

In H2a-d, relationships amongst the Theory of Planned Behaviour Variables and KPB were also estimated. As was reported in this study, all four of the TPB variables, i.e., Attitude, Norm Perceived Behavioural Control and Intention, have strong, positive, and statistically significant relationships with each other. However, Subjective Norms did not predict behavioural intentions for KPB. We expected knowledge productivity behaviour to relate positively to Subjective Norm as encouragement from outside sources will influence intentions for KPB. Since the Theory of Planned Behaviour variables correlated amongst themselves to some extent, it was possible that there was enough shared variance to hide otherwise significant effects this could be seen in the in the strong relationship between PBC with other remaining predictors.

Moreover sub-models specified to test Hypotheses H3a and H3b for their direct effects, predicting Emotional Stability and Openness traits on Attitude, reported that only Openness variable had significant effects on Attitude. Again, this result is consistent with prior Social Science study, we expected Attitude to relate positively to Emotional Stability. In prior study conducted by Rushton, Murray, & Paunonen (1982), this study found that successful researchers have average or low scores on neuroticism would appear to be successful researchers. However, results shows that Emotional Stability were not statistically significant

effects for Attitude were consistent with prior correlations results show a none positive correlation between Attitude and Emotional Stability.

Finally, this study also estimated the interaction effects of Extraversion, Agreeableness and Conscientiousness with Subjective Norms and Perceived Behavioural Control on Intention. We expected that individuals higher in personality traits will be more knowledgeable of Subjective Norms, and that this knowledge will more strongly influence their intentions engaging in academic productivity behaviours. Nonetheless, these results indicate all of these hypotheses are not supported. These findings are consistent with the H2c results, which suggests that subjective norms, does not predicting and intentions.

Overall in this study even though the Big Five personality traits and the interactions between the TPB variables did not had any significant unique impacts. This study does provide result suggests that both Big Five personality traits and TPB variables may improve the predictive validity of KPB of academics. Increasing the traits and the behavioural control by KPB are crucial variables to enhance an individual's engagement related to KPB behaviours.

7.3 Discussion of Multi-group analyses results T1 Social Science and Science Technology Study Sample Results

In this sub section, the result multi-group analyses results T1 Model 1 and Model 2 for both Social Science and Science Technology evidence that the path from Openness to Social Norms might different between the Social Science and Science Technology samples, but that all remaining path coefficients were equivalent. Overall in this study shows that when both samples were estimated and when personality and behavioural were included in the model again only one strong personality predictor Openness trait is needed to adequately capture effects for KPB constructs: KA KS and KT. Apparently Openness to Social Norms path was significantly different in the two samples and although it was positive and statistically significant in both samples. This outcome affirms the discoveries of scholar, for example according to Raudsepp (1990) noted that individual with high level of openness exhibit a dynamic innovative thought, care to interior feelings and a tendency for variety, all of which explain why they are assessed top on their work performance and creative thinking.

7.4 Discussion of T2 Social Science Study Sample Results

Overall, with the outcomes in this study, it is suggested that from the T2 Models which individual differences factors such as personality traits and attitudinal components do influence the Knowledge Productivity Behaviour (KPB) of academicians.

All possible relationships among the set of five personality variables and KPB were estimated. These results support the preliminary hypotheses, however in T2 the hypothesis for Testing B5 variables have effects of KPB reported only one H1a Openness trait had statistically significant with KPB. This result is contrary with T1 as in T1 few other traits support the hypotheses (e.g. Extraversion and Agreeableness) interesting we expected knowledge productivity behaviour to relate positively to Conscientiousness because academics may view research productivity as a requirement of their positions and Emotional Stability as knowledge productivity behaviour requires logical and rationale behaviour, and often involves complex problems that need persistence and optimism to be solved. A part from that Extraversion traits are likely to be effective in teams, as they stimulate and encourage discussion (Mohammed & Angell, 2003; Taggar, 2002) and Agreeableness has been proven to influence job performance, especially when collaboration and cooperation amongst peers is important (e.g., Mount, Barrick, & Stewart, 1998; Judge et al., 1999; Witt et al., 2002). However, results shows that Extraversion, Agreeableness, Conscientiousness and Emotional Stability do not predicting KPB behaviour.

In addition, relationships amongst the Theory of Planned Behaviour Variables and KPB were also estimated in this study. As was reported in this study, all four of the TPB variables, i.e., Attitude, Norm Perceived Behavioural Control and Intention, have strong, positive, and statistically significant relationships with each other. However, Subjective Norms did not predict behavioural intentions for KPB. We expected knowledge productivity behaviour to relate positively to Subjective Norm as encouragement from outside sources will influence intentions for KPB. Since the Theory of Planned Behaviour variables correlated amongst themselves to some extent, it was possible that there was enough shared variance to hide otherwise significant effects this could be seen in the significant relationship of PBC with others predictors.

Moreover T2 sub-models specified to test T2 Hypotheses H3a and H3b for their direct effects, proposing relationships of the Big Five Emotional Stability and Openness traits on and TPB variable of Attitude, indicate that only one variable had significant path coefficients on Attitude which is Openness. Identically , in T1 and T2, the Emotional Stability scale was scored with the higher pole representing emotional stability (i.e., the opposite of Emotional Stability), we expected Attitude to relate positively to Emotional Stability. However, results shows that Emotional Stability does not have statistically significant effects on Attitude. This results were consistent with prior correlations and results in T1and T2 shows a none positive correlation between Attitude and Emotional Stability.

Finally, this study also tested the interaction effects of selected Big Five personality traits (Extraversion, Agreeableness and Conscientiousness) with the TPB variables of Subjective Norms and Perceived Behavioural Control on Intention. Nonetheless, these results indicate all of these hypotheses were not supported. These findings are consistent with the T1 and T2 H2c results, which suggests that subjective norms, does not significantly predicting and do not have mediated effect on Knowledge Productivity Behaviour via behavioural intention.

7.5 A Return to the Main Research Questions

The nature of this thesis, i..e., an exploration of the relationship between individual differences and knowledge productivity, means that several key strands of literature are relevant. One is the division of KPB itself where it has encompassed three knowledge activities; knowledge acquisition, knowledge sharing and knowledge transfer. Second are the predictors which are Big Five model and the Theory of Planned Behaviour (as mediator). This study not only found out the differentiation between individual differences but also showed the changes of knowledge productivity from two different school; Social Science and Science and Technology and supplement with one year follow up study. The following paragraphs discuss the outcomes of the three main research questions.

1. To what extent do the Big Five personality traits relate to knowledge productivity?

2. To what extent do the Theory Planned Behavior variables relate to knowledge productivity?

3. To what extent are the Big Five personality effects on knowledge productivity mediated through the Theory of Planned Behavior variables?

7.6 The finding of what extent does the Big Five personality traits increase knowledge productivity

This section elaborates the second main questions that had been prompted in the literature review. In reference to the previous researches, there are five personality traits: extraversion, agreeableness, openness, conscientiousness and emotional stability, and these were tested in the questionnaire for both T1 and T2. According to the quantitative data for both T1 (Social Science and Science Technology) and T2 (Social Science), only one of the predictor 'openness' were considered adequate to captured academics knowledge productivity which may increase research activities and leaving the remaining predictors non-significant. According to Paunonen, Rush, and King (1994), it has been suggested that behavioural tendencies mirrored inside character features (personality) have an effect on particular habits that may offer an effect on academic achievement.

In contrast, quantitative analysis shows that, all of these traits are not significant in capturing academic knowledge productivity. Supported by Matzler et al. (2008), which noted that individuals with high scores on openness are likely involved in contributing to and seeking knowledge. Costa & McCrae (1992) also suggests that individuals with high levels of this characteristic show curiosity, and are willing to embrace new ideas as well as criticism and suggestions from others, and they accept either positive or negative values more intensely than individuals with lower values of openness. The result from Cambridge Personal Styles Questionnaire (CPSQ), 2017 is supported by this outcome, individual's openness to experience is typically based on curiosity, imagination, creativity, and willingness to consider novel ideas. According to Ostendorf and Angleitner, (1994), it is known as "Intellect" or "Openness to Ideas" which may cause the tendency to seek or explore more complex cognitive material which is a behavioural pattern that implies to the observer's intelligence. Undeniably, Openness measurement shows small to modest correlation with the cognitive ability tests, particularly abilities that involve divergent thinking such as creative, fluid and flexible thinking (McCrae, 1987).

7.7 The finding of what extent does the Theory Planned Behavior variables increase knowledge productivity

This section discusses the third main questions which have been examine in the quantitative data analysis. Based on the review of prevalent literatures, the Theory Planned Behaviour (TPB) In various domains, prediction of intentions and behaviours have been applied successfully by the TPB (Harrison, Mykytyn, & Riemenschneider, 1997, p. 172), there are three important component of the Theory Planned Behaviour which define the strength of behavioural intentions: individual's attitude, subjective norms, and perceived behavioural control (Ajzen, 1991). These were tested in the questionnaire for both T1 and T2. According to the quantitative data for both T1 (Social Science and Science Technology) and T2 (Social Science), only two of the factors 'attitude and perceived behavioural control' were considered adequate to captured academics knowledge productivity behaviour and leaving the subjective norms non-significant. According to Gagne and Medsker (1996), Attitude is referred to as an individual's internal state that influences the individual's choice of actions or responses. Meanwhile, Gardner and Korth (1998) defined that attitude towards teamwork was an individual's willingness (internal state) to continuously work together with the same and other teams (personal action). This type of outcome supports the results from (De Vries et al., 2006) in their studies, which noted that attitude as a moderator between personal factors and knowledge sharing intention. As reported in (Sheeran & Orbell, 1999). For example, Sheeran & Orbell mentioned that in a number of studies it has been demonstrated that attitudes have made significant contributions to the prediction of behavioural intentions.

In this study, perceived behavioural control were also reported significant in the quantitative data for both T1 (Social Science and Science Technology) and T2 (Social Science). Mathieson, (1991) mentioned in the previous study that perceived behavioural control can be affirmed based on the individual's perception on the available skills, resources, opportunities, and his/her assessment on the significance of the skills to perform the behaviour. Blue et. al. (2001) claimed that PBC is a strong predictors. Accordance with previous studies by Ryu et al., (2003); Lin and Lee, (2004). Meanwhile, Lin and Lee (2004) found that highlighted that perceived behaviour is one of the primary factors that had positive impact on knowledge sharing.

However, lack of perceived behavioural control may affect negatively on the knowledge sharing (Ryu et. al., 2003). Undeniably, an individual's perception about the level of his/her control over behaviour affects their intention to perform a behaviour (Blue et. al., 2001).

While norm are reported none significant in the quantitative data, contrary with qualitative data, where most of the respondents agree that their department promotes and mentors faculty research and publication productivity. Reported in question 6 probe participants' factors influence in becoming productive researcher "*What would help you to be more productive researcher?* Seventeen percent of lecturers claimed that the significant factor for them was "management support." This shown that theoretically that subjective norm proven to be one of the factor influencing academics knowledge productivity behaviours. This suits to prevalent literatures, Badingatus Solikhah (2014) notes that encouragement from the outside, such as parental influence, spouse's support, and teacher's encouragement, will influence intentions. Supported by (Ryu et al., 2003; Lin and Lee, 2004), which noted that subjective norms have shown a significant relationship with knowledge sharing intention in a number of studies.

7.8 The finding of to what extent are Big Five personality effects on knowledge productivity mediated through the Theory Planned Behaviour variables

This section discusses the last main questions which have been tested in the quantitative data analysis. Based on the review of prevalent literatures, for example Chatzisarantis and Hagger (2008), who studied participation in physical activity, and argued that the theory of planned behaviour does not capture all variance in their outcome that can be explained by antecedent variables, and that personality traits may improve the predictive validity of the model.

Chatzisarantis and Hagger (2008), who studied participation in physical activity, argued that planned behaviour theory does not capture all the variance in their outcomes which can be explained by antecedent variables and the predictive validity of the model may improve based on personality traits. Rhodes, Courneya & Jones, (2002); Conner & Abraham, (2001); Courneya, Bobick & Schinke, (1999), with support of three past studies, had utilized

personality variables as antecedents to the TPB components for health-related prediction and exercise behaviours.

In this study, a model was estimated looking at the interactions of the Big Five and TPB variables on Intention and these analyses were tested in the questionnaire for both T1 and T2. According to the quantitative data for both T1 (Social Science and Science Technology) and T2 (Social Science), overall the results reported none of the traits have effects on knowledge productivity mediated through the Theory Planned Behaviour variables.

Similarly, this finding was reported in a study by McRae & Costa, (1987). He noted the addition of Big Five personality traits had failed to provide significant impact on the variance in order to support the mediation hypothesis. Conner Abraham (2001), asserted that neuroticism was not identified as the PBC did not mediate the neuroticism-intention relationship.

7.9 The finding of factors which individual factors influence Knowledge Productivity Behaviour when associated with factors such as gender, rank, teaching loads and etc

In this section the author incorporates the attribute of individual factors which may influence Knowledge Productivity Behaviour. In this study, in quantitative data analysis, there are nine individual factors: "gender, age, qualification, first academic appointment, services with university, position, faculty position, teaching and supervision". Based on the findings for both T1 (Social Science and Science Technology) and T2 (Social Science), none of these individual factors influence the knowledge productivity behaviour. Contradictory in the qualitative data, the author further address research questions related to why academics are motivated or hindered from engaging in research and related knowledge transfer activities, the findings indicate that in order to conduct a research, it is important to consider individual factors as a part of academic motivation factors which including both intrinsic and extrinsic factors (minority). Reported in qualitative data, question 3 more directly probed participants' motivations for doing research and publishing, asking participants fifteen out of twenty-four lecturers mentioned "requirement, promotion, performance appraisal and job tenure" and eight percent of lecturers expressed that the main factor for them was "recognition" (further details refer to table 5.6.3).

Reported in question 8 investigate participants' view about suggestions for university in improving the productivity of research and publication of the staff. Forty six percent of lecturers mentioned their main factor were "increase fund, grant and budget allocation." Five lecturers stated "reduce teaching loads." Three lecturers expressed that the main factors for them were "give rewards." Thirteen percent of lecturers mentioned "more facilities" (further details refer to table 5.11.1). This outcomes evidence the findings from Mischel (1968) suggested that although some predictions could be made from traits, the most powerful ones would likely be made by taking situational factors into account.

As in environmental context, situational variables are regards as contributing elements in manipulating the information of faculty members' research performance (see Allport & Vernon, 1933; Dudycha, 1936; Hartshorne & May, 1928; Newcomb, 1929). Jain et al. (2007) had performed a study with 265 academic staffs in both public and private business schools around the Klang Valley, Malaysia. The outcome revealed that inadequate of rewards and recognition as well as lack of activities seemed to be the ultimate barrier to knowledge sharing. Meanwhile, as for the support from the top management, few variables such as connections between rewards and behaviour, knowledge on publication via internet, and the utilization of newsletters are crucial to promote knowledge sharing.

7.10 Suggestions for University

In the qualitative data discussion, the interviewee was asked to provide suggestion or advice for the university in improving the productivity of research and publication of the staff.

The interview findings concluded with the items listed in Table 7.9.

Table 7.9 Summary of Advice to University Policy Makers provided by Study Participants

1. The top management should reduce academic administrative duties and support academic sabbatical and study leaves.
2. The University should put more emphasis on building academics' self promotion in website by listing all the publications.
3. The needs of the different staff level should be made in accordance to the motivation policy.
4. The University should give academic staff enough time to conduct research.
5. Building a better research culture such as holding a colloquium or establishing a better competitive and rewards mechanism between faculties should be emphasized by the University.
6. Stronger emphasis should be placed onto the research support, such as research grants and simplified process, library resources and research trainings.
7. The University press and PJI should put more emphasis on giving research awareness for example; linkage between PJI and HoF and academics.
8. Academic staff needs on-going support motivation and encouragement from the

University and top management. For example, offering more opportunities to communicate with other academicians in the conference, providing social contacts for data collection, inviting higher level academicians to present and share their knowledge and experience.

9. Improve research and writing skills, establishing group writing among faculty members allows them to discuss their works and review each other's manuscript.
10. Giving incentive or rewards and recognition could influence and boost the academics' spirits in producing research.

The aforementioned suggestions were concluded based on the individual's interview. It gives greater insights of the real needs by the academic staff to the university policy makers. Besides that, demonstration of different expectations from the academic staffs should be conducted against the universities policies. Thus, this section aims to provide better understanding to the university policy makers to listen to various opinions from the staff of various levels. Staff and they can express their opinion related to the policy matters by understanding the different needs from the staff and different levels.

7.11 Research Limitation and Future Research

Generally, this thesis primarily quantitative data was used to investigate factors that influence knowledge productivity and supplement by qualitative data, interviews were conducted for better understanding in discover potential factors of research motivation and productivity among academic. In the process of exploration, it is fair to draw attention to some limitations of the study; the limitation and direction for future research are addressed as the following paragraphs in further details.

One weakness is the number participation of respondents in the Time 2 (T2) survey. It was only possible to conclusively match 156 T2 social science respondents to their T1 data, making the predictive power of the T2 data analyses substantially lower than either the T1 social sciences or science and technology samples. Therefore, non-significant results from this sample should be interpreted with caution as power might not have been high enough to have a good likelihood of finding all possible weak or even moderate effects. In order to reduce the limitation, future research can pursue this study by developing additional studies., now that the current studies have provided evidence of the usefulness of these variables to understanding individual-level influences on knowledge productivity behaviour.

Another limitation was the depth of the qualitative data collection. The interview average duration time was 10 minutes, with a range from 5 minutes to 27 minutes. In part, this might have been due to some of the younger lecturers having less experience and insight on the topic. Thus whilst valuable supporting information was gained from the interviews, further qualitative investigations on this topic would be expected to yield additional, more detailed and richer data. Therefore, the author recommend future researchers in future studies interview duration can be extended to much deeper interview sessions and more senior level researchers could be included. Another limitation of the study is emphasis towards comprehensive public university, concerning the government financial support. Up to date, more than 20 public universities and up to 43 private universities and 31 standard institutions of higher education in Malaysia. Eventhough UiTM is a largest comprehensive university, yet UiTM does not belong either in Malaysia research university (MRU). The range of the research is limited. Thus, the findings of this study cannot cover all of the knowledge productivity needs of MRU which indicates that there is a lack of comparison in several disciplines, as T2 survey are not be able to run for further analyses. Various aspects of academic life emphasize the importance of discipline. Based on Klein (2001), impact over the organization or production of knowledge can be influenced. Thus, intensive research may extend to focus on research on research universities and comparison of academic's knowledge productivity through different disciplines should be studied. For instance, Science staffs teaching in science and technology discipline may need a different motivational support compared to the social science staffs.

Moreover, is the outcome of this study. This study targets to examine the sources that influence the academic research motivation and its productivities which depends on academic knowledge activities; knowledge acquisition, knowledge sharing and knowledge transfer but ignored the outcome or evidence of knowledge productivity such as journal verification. Therefore, based on the limitation of the research, future study could look on the physical contribution and outcome itself (i.e. books, patent, journal, and proceeding). To find out whether staff knowledge productivity improvement, evidence of any knowledge activities is the key to count academic knowledge productivity.

The last but not the least, is the motivation of the staff in doing research activities and staffs satisfaction, even though factors has been addressed in the qualitative data, yet not in quantitative data. Again qualitative data is just a supplementary toward this study, whereas quantitative data is the primary focus. This study targets to examine the sources that influence the academic research motivation and its productivities. However, the motivation and satisfaction of the academic staff should not being ignored.

The effectiveness of motivation policy should consider on the staffs' satisfaction. In fact, the higher level of satisfaction contributes to a higher level of motivation and productivity (Santo, 2009). Individual's commitment can be attained when there is a human psychological characteristic known as motivation. The input and output performance of an employee in an organization should be taken into consideration. It is crucial for an individual to have someone to motivate as it is essential to the effectiveness and performance of the organization (Stoner, 2002). Meanwhile, further research should be done as a reference to help the policymakers in setting the policy by taking into consideration of the staffs' satisfaction on the current policy. By doing so, the policymakers will be able to improve or modify the new policy.

7.12 Conclusion

In this study, the thesis had seen the factors that driven the academic staff to perform the research which increasing their knowledge productivity behaviours. In addition, for the quantitative part, quantitative method was conducted to collect and analyse the data. With supplement of qualitative data, it is hope that the findings of this study were comprehensive. Through the comparison between two school Social Science and Science Technology analysis, the outcomes covers the significant factors of Knowledge Productivity behaviour and also the distinctive features of knowledge productivity behaviour factors at each different school (result based on T1 survey).

Through a similar method (online survey), the factors that affected the knowledge productivity behaviour were discovered. Based on the individual's interview, recommendations on how to improve the research productivity and motivation policy were highlighted. At the end of the discussion, the participants were required to give their view or advice to the policy makers to enhance the research activities.

This study implicates that even though not all Big Five were considered as potential predictors which effects academics knowledge productivity behaviours, yet openness played as strong individual predictor of knowledge productivity behaviour. The result from (CPSQ) 2017, is supported by this outcome. Individual with high openness experience fosters thinking styles and intelligent behaviours that promote academic success and creative and flexible thinking in business. Furthermore, the quantitative data findings also reported that subjective norms do not influence academics knowledge productivity behaviours. However, in qualitative data, practically norms do play significant roles in influencing academics research and knowledge productivity. Thus, subjective norm theoretically proven does contribute on knowledge productivity, which applied in this study (Karjaluoto et al., 2016), reviews and recommendation by the peers can influence the decisions.

In conclusion, this study potentially provides the theoretical insights on how personality characteristics (for example B5) may impact on the performance outcomes by exploring the potential facilitator and moderating mechanism that comprise of TPB's components. Implications for university administrators were highlighted as proof of the study's practical significances. As they are the managing faculty members who have better understanding of how to increase their success in research and generate higher publications. In addition, the highlights on the factors of success in leading to knowledge production help other universities in different contexts to develop strong academics by absorbing and understanding the research management practices.

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APPENDICES

APPENDIX 1: ETHICAL APPROVAL

Durham University Business School

BETTER BUSINESS THINKING

Miss Siti Nur Shahira binti Dahari
Durham University Business School

23 May 2016

Dear Siti:

Project title: "The joint effects of personality and behavioural intentions on academic knowledge productivity behaviours "

I would like to confirm that your project has been granted ethics approval as it has met the review conditions.

Should there be a material change in the methods or circumstances of your project, you would in the first instance need to get in touch with me for re-consideration and further advice on the validity of the approval.

I wish you both the best of luck on the completion of your research project.

Yours sincerely,

[electronic signature by email]

Dr Danny Chow
Chair of the ethics sub-committee

Email: danny.chow@durham.ac.uk
Tel (direct line): +44 191 3345288

APPENDIX 2: PILOT STUDY QUESTIONNAIRE

Dear respected respondents,

My name is Shahira and I am a postgraduate student at Durham University. For my doctoral dissertation, I am examining the personal and social factors influencing the level of knowledge productivity behaviour of the academicians in UiTM Malaysia. As you are an academic, I am inviting you to participate in this pilot study by completing the questionnaire. The following questionnaire will require approximately 10-20 minutes to complete. It is hoped that your voluntary responses will provide valuable information for constructing a good questionnaire. Your comment and suggestions are gratefully appreciated.
If you require additional information or have questions, please contact me at the number listed below

Many thanks,
Siti Nur Shahira Binti Dahari
(+60127807803 / dahari.s.shahira@durham.ac.uk)

DEMOGRAPHIC INFORMATION:
Please give your answer by specifying or ticking on the appropriate boxes.

1. Gender:
   - ☐ Male
   - ☐ Female

2. Please indicate your age: _____

3. Highest academic qualification
   - ☐ Bachelor degree
   - ☐ Master
   - ☐ Doctorate

4. What is the year of your first academic appointment? (this might be at another institution) _____

5. Years of services in UiTM: _____

6. Faculty Position:
   - ☐ Academic Staff - Admin
   - ☐ Academic Staff - Non Admin

7. Position Grade:
   - ☐ Part time/ Full Time Lecturer
   - ☐ Contract Lecturer
   - ☐ Lecturer
   - ☐ Senior Lecturer
   - ☐ Associate Professor
   - ☐ Professor

8. Teaching:
   - ☐ Undergraduate only
   - ☐ Postgraduate only
   - ☐ Undergraduate and postgraduate

9. Supervision of students' theses and dissertations:
   - ☐ Yes, undergraduate only
     If yes, please indicate how many students this year; _____
   - ☐ Yes, postgraduate only
     If yes, please indicate how many students this year; _____
   - ☐ Yes both undergraduate & postgraduate
     If yes, please indicate how many students this year; _____
   - ☐ None

10. Faculty/ School:
    - ☐ Information Management
    - ☐ Business & Management
    - ☐ Accountancy
    - ☐ Hotel & Tourism Management
    - ☐ Administrative Science & Policy Studies
    - ☐ Law
    - ☐ Art & Design
    - ☐ Academy of Language Studies
    - ☐ Communication & Media Studies
    - ☐ Academy of Contemporary Islamic Studies
    - ☐ Music
    - ☐ Education
    - ☐ Film, Theater & Animation

In this first set of questions, please indicate to what extent you agree with the following statements related to doing research and publishing or presenting academic papers by circling the number that best describes your personal opinions.

Statement 1	
1. I look forward to those aspects of my job that will allow me to present and publish peer reviewed papers.	disagree: _1_2_3_4_5_6_7_: agree
2. The effect on my career of presenting and publishing peer reviewed research papers is likely to be	bad: _1_2_3_4_5_6_7_: good
3. The idea of sharing my research knowledge with other colleagues, is	unpleasant: _1_2_3_4_5_6_7_: pleasant
4. It is a wise move to share my research knowledge with other colleagues.	disagree: _1_2_3_4_5_6_7_: agree
5. The effect on my career of attending professional conference, is	unbeneficial: _1_2_3_4_5_6_7_: beneficial
6. Reading professional journals in my research area, is	not valuable: _1_2_3_4_5_6_7_: valuable
7. Publishing my paper in a good quality journal, is	unbeneficial: _1_2_3_4_5_6_7_: beneficial
8. Presenting my work at a major conference, is	unbeneficial: _1_2_3_4_5_6_7_: beneficial

Statement 2	
1. Most of my colleagues think I should publish at least one peer-reviewed paper per year.	disagree: _1_2_3_4_5_6_7_: agree
2. Most academicians at my level publish at least one peer-reviewed paper in a good journal in a year.	disagree: _1_2_3_4_5_6_7_: agree
3. My Dean/ Head of Department/colleagues/ will view me more favourably if I publish at least one peer-reviewed paper next year.	disagree: _1_2_3_4_5_6_7_: agree
4. I have the duty to share my research-related knowledge with others.	disagree: _1_2_3_4_5_6_7_: agree
5. Most researchers in my discipline share their research knowledge with others.	disagree: _1_2_3_4_5_6_7_: agree
6. I am expected by my colleagues to keep up with new trends in my research areas.	disagree: _1_2_3_4_5_6_7_: agree
7. Keeping up with new knowledge by reading academic and professional journals is expected of researchers in my research area.	disagree: _1_2_3_4_5_6_7_: agree
8. Most researchers in my discipline regularly publish articles in refereed journals.	disagree: _1_2_3_4_5_6_7_: agree
9. Most researchers in my discipline regularly present at refereed conferences.	disagree: _1_2_3_4_5_6_7_: agree

In this first set of questions, please indicate to what extent you agree with the following statements related to doing research and publishing or presenting academic papers by circling the number that best describes your personal opinions.

Statement 3	
1. I have the ability to publish at least one high level peer reviewed paper in the next year.	unlikely: _1_2_3_4_5_6_7_: likely
2. For me to publish a minimum of one peer reviewed paper in a year, would be	difficult: _1_2_3_4_5_6_7_: easy
3. I have the resources and the knowledge and the ability to share my research knowledge with others.	disagree: _1_2_3_4_5_6_7_: agree
4. If I wanted to, I could access resources to upgrade my research knowledge.	unimportant: _1_2_3_4_5_6_7_: important
5. I will have the resources, knowledge and ability to upgrade my research skill.	unlikely: _1_2_3_4_5_6_7_: likely
6. My ability to publish at least one paper in a year is under my control	disagree: _1_2_3_4_5_6_7_: agree
7. I have the ability to present my work in a professional conference	unlikely: _1_2_3_4_5_6_7_: likely

Statement 4: Intention	
1. I intend to publish a minimum of one peer reviewed paper within the next year	disagree: _1_2_3_4_5_6_7_: agree
2. I will make publishing at least one peer reviewed paper a priority.	unimportant: _1_2_3_4_5_6_7_: important
3. Over the next year, I intend to share my research knowledge with my colleagues	disagree: _1_2_3_4_5_6_7_: agree
4. Over the next year, I plan to update my knowledge of my field by attending conferences.	unimportant: _1_2_3_4_5_6_7_: important
5. Over the next year, in order to improve my research knowledge, I will read and think about new ideas	disagree: _1_2_3_4_5_6_7_: agree
6. Over the next year, I will critically analyze new information about my research area in order to see if it should influence what I do.	disagree: _1_2_3_4_5_6_7_: agree
7. Over the next year, I will make an effort to publish a peer reviewed paper	likely: _1_2_3_4_5_6_7_: unlikely
8. Over the next year, I will participate in informal meetings, conferences, competition and exposition related to my research areas.	likely: _1_2_3_4_5_6_7_: unlikely

The next set of questions asks you to provide us with an idea of how you view yourself. Please describe yourself as you generally are now, not as you wish to be in the future. Describe yourself as you honestly see yourself, in relation to other people you know of the same sex as you are, and roughly your same age. So that you can describe yourself in an honest manner, your responses will be kept in absolute confidence.

Indicate for each statement whether it is 1. Not accurate, 2. Moderately inaccurate, 3. Neither accurate nor inaccurate, 4. Moderately accurate, or 5. Very accurate as a description of you.

I see myself as someone who (is):		Not accurate (1)	Moderately inaccurate (2)	Neither accurate nor inaccurate (3)	Moderately accurate (4)	Very Accurate (5)
1.	Full of energy/ life of the party.					
2.	Feel little concern for others.					
3.	Always prepared.					
4.	Get stressed out easily.					
5.	Have a rich vocabulary.					
6.	Doesn't talk a lot.					
7.	Interested in people.					
8.	Leaves my belongings around.					
9.	Relaxed most of the time.					
10.	Has difficulty understanding abstract ideas.					
11.	Feels comfortable around people.					
12.	Insults people.					
13.	Pays attention to details.					
14.	Worries about things.					
15.	Has a vivid imagination.					
16.	Keeps in the background.					
17.	Sympathizes with others' feelings.					
18.	Makes a mess of things.					
19.	Seldom feels blue.					
20.	Not interested in abstract ideas.					
21.	Starts conversations.					
22.	Not interested in other people's problems.					
23.	Gets chores done right away.					
24.	Easily disturbed.					
25.	Has excellent ideas.					
26.	Has little to say.					
27.	Has a soft heart.					
28.	Often forgets to put things back in their proper place.					
29.	Gets upset easily.					
30.	Does not have a good imagination.					

I see myself as someone who (is):		Not accurate (1)	Moderately inaccurate (2)	Neither accurate nor inaccurate (3)	Moderately accurate (4)	Very Accurate (5)
31.	Talks to a lot of different people at parties.					
32.	Not really interested in others.					
33.	Likes order.					
34.	Changes my mood a lot.					
35.	Quick to understand things.					
36.	Doesn't like to draw attention to myself.					
37.	Takes time out for others.					
38.	Shirks my duties.					
39.	Has frequent mood swings.					
40.	Uses difficult words.					
41.	Doesn't mind being the center of attention.					
42.	Feels others' emotions.					
43.	Follows a schedule.					
44.	Gets irritated easily.					
45.	Spends time reflecting on things.					
46.	Quiet around strangers.					
47.	Makes people feel at ease.					
48.	Exacting in my work.					
49.	Often feels blue.					
50.	Full of ideas.					

The last set of items deals with your knowledge productivity. Please think about your **knowledge activities over the past 12 months till recently**. Please indicate how frequently you have engaged in the following activities by circling on the appropriate scale**.**

Please indicate how frequently you have engaged in the following activities by circling on the appropriate scales **Your knowledge acquisition over the past year:**	Not at all (1)	1-2 times this year (2)	1-2 times per semester (3)	1-2 times most months (4)	1-2 times most weeks (5)
1. I read professional journals and similar sources to acquaint myself with new ideas that might be relevant to my research interests.	1	2	3	4	5
2. I attended a professional conference to keep current with what is happening in my research area(s).	1	2	3	4	5
3. I spoke with researchers inside or outside of my institution to determine what is new in my area of expertise.	1	2	3	4	5
4. I attended workshops or trainings to learn new research-related skills or content.	1	2	3	4	5
5. Within the past year I joined or maintained a membership in a professional organization to keep current with new research directions. Yes: ☐ No ☐					

Please indicate how frequently you have engaged in the following activities by circling on the appropriate scales **Your knowledge sharing over the past year:**	Not at all (1)	1-2 times this year (2)	1-2 times per semester (3)	1-2 times most months (4)	1-2 times most weeks (5)
1. I share academic knowledge and research experiences through informal discussions	1	2	3	4	5
2. I shared my research experiences with my colleagues/research partners.	1	2	3	4	5
3. I informed my colleagues about new ideas, methods and research skills.	1	2	3	4	5
4. I shared my research documents with my colleagues/research partners.	1	2	3	4	5
5. I shared my expertise from my research training with my colleagues/research partners.	1	2	3	4	5
6. I got new thoughts from brainstorming with my colleagues/research partners.	1	2	3	4	5
7. I sought colleagues out for advice on a project I was working on.	1	2	3	4	5
8. I shared work-in-progress with my colleagues/research partners.	1	2	3	4	5

Please indicate how frequently you have engaged in the following activities by circling on the appropriate scales **Your knowledge transfer over the past year:**	Not at all (1)	1-2 times this year (2)	1-2 times per semester (3)	1-2 times most months (4)	1-2 times most weeks (5)
1. I worked on a report of research findings that is intended for submission to a professional conference.	1	2	3	4	5
2. I worked on a report of research findings that is intended for submission to an academic/professional journal.	1	2	3	4	5
3. I worked on a book or book chapter reporting my research findings.	1	2	3	4	5
4. I submitted a paper to a academic conference.	1	2	3	4	5
5. I submitted a paper to a journal.	1	2	3	4	5
6. I revised a paper that has received a journal review.	1	2	3	4	5
7. I presented a paper at a professional conference.	1	2	3	4	5
8. I had a journal article accepted.	1	2	3	4	5

Please give your answer by specifying in the appropriate boxes. **Your knowledge transfer over the past year:**	
9. Over the past academic year, how many paper presentations at a professional conference did you have?	
10. Over the past academic year, how many accepted journal article did you have?	
11. How many of these were in high quality, peer-reviewed journals?	
12. Did you have any other major academic research outputs during the past academic year? (e.g. patents, books, etc.) Please specify.	

a) Please note any factors that you believe are important for encouraging and supporting you to present and publish in high impact outlets.

_____
_____
_____
_____

b) Please note any factors that you believe create barriers against your present and publish in high impact outlets.

_____
_____
_____
_____

End of Questionnaire

"Your cooperation is gratefully appreciated"

Please note any comments and suggestions, your feedbacks are very much appreciated. Thank you.

APPENDIX 3: MAIN STUDY QUESTIONNAIRE

Dear respected respondents,

My name is Shahira, and I am a postgraduate student at Durham University. For my doctoral dissertation, I am examining the personal and social factors influencing the level of knowledge productivity behaviour of the academics in UiTM Malaysia. As you are an academic, I am inviting you to participate in this study by completing the questionnaire. The following survey will require approximately 10-20 minutes to complete. Your voluntary responses will be kept private and will be utilised for education and research purposes only. The data collected will provide useful information for my research. Thank you for your assistance in this important endeavour. If you require additional information or have questions, please contact me at the number listed below.

Sincerely yours,
Siti Nur Shahira Binti Dahari
(+60127807803 / dahari.s.shahira@durham.ac.uk)

DEMOGRAPHIC INFORMATION:
Please give your answer by specifying or ticking the appropriate boxes.

1. Gender:
   - ☐ Male
   - ☐ Female

2. Please indicate your age: _____

3. Highest academic qualification
   - ☐ Bachelor degree
   - ☐ Master
   - ☐ Doctorate

4. What is the year of your first academic appointment? (this might be at another institution) _____

5. Years of services in UiTM: _____

6. Faculty Position:
   - ☐ Academic Staff - Admin
   - ☐ Academic Staff - NonAdmin

7. Position Grade:
   - ☐ Part time/ Full Time Lecturer
   - ☐ Contract Lecturer
   - ☐ Lecturer
   - ☐ Senior Lecturer
   - ☐ Associate Professor
   - ☐ Professor
   - ☐ Other (please specify): _____

8. Teaching:
   - ☐ Undergraduate only
   - ☐ Postgraduate only
   - ☐ Undergraduate and postgraduate

9. Supervision of students' theses and dissertations:
   - ☐ Yes, undergraduate only
     If yes, please indicate how many students this year; _____
   - ☐ Yes, postgraduate only
     If yes, please indicate how many students this year; _____
   - ☐ Yes both undergraduate & postgraduate
     If yes, please indicate how many students this year; _____
   - ☐ None

10. Faculty/ School:
    - ☐ Information Management
    - ☐ Business & Management
    - ☐ Accountancy
    - ☐ Hotel & Tourism Management
    - ☐ Administrative Science & Policy Studies
    - ☐ Law
    - ☐ Art & Design
    - ☐ Academy of Language Studies
    - ☐ Communication & Media Studies
    - ☐ Academy of Contemporary Islamic Studies
    - ☐ Music
    - ☐ Education
    - ☐ Film, Theater & Animation

In this first set of questions, please indicate to what extent you agree with the following statements related to doing research and publishing or presenting academic papers by circling the number that best describes your personal opinions.

Statement 1	
1. I look forward to those aspects of my job that will allow me to present and publish peer-reviewed papers.	disagree: _1_2_3_4_5_6_7_: agree
2. The effect on my career of presenting and publishing peer-reviewed research papers is likely to be	bad: _1_2_3_4_5_6_7_: good
3. It is a wise move to share my research knowledge with other departmental colleagues.	disagree: _1_2_3_4_5_6_7_: agree
4. The effect on my career of attending academic conference is	unbeneficial: _1_2_3_4_5_6_7_: beneficial
5. Reading professional journals in my research area is	not valuable: _1_2_3_4_5_6_7_: valuable
6. Publishing my paper in a high-quality journal is	unbeneficial: _1_2_3_4_5_6_7_: beneficial
7. Presenting my work at a major conference is	unbeneficial: _1_2_3_4_5_6_7_: beneficial

Statement 2	
1. Most of my departmental colleagues think I should publish at least one peer-reviewed paper per year.	disagree: _1_2_3_4_5_6_7_: agree
2. Most academics at my level publish at least one peer-reviewed paper in a high-quality journal in a year.	disagree: _1_2_3_4_5_6_7_: agree
3. My Dean/ Head of Department/colleagues/ will view me more favourably if I publish at least one peer-reviewed paper next year.	disagree: _1_2_3_4_5_6_7_: agree
4. I have a duty to share my research-related knowledge with others.	disagree: _1_2_3_4_5_6_7_: agree
5. Most researchers in my discipline (both in my department and at other universities) share their research knowledge with others.	disagree: _1_2_3_4_5_6_7_: agree
6. I am expected by my departmental colleagues to keep up with new trends in my research areas.	disagree: _1_2_3_4_5_6_7_: agree
7. Keeping up with new knowledge by reading academic journals is expected of researchers in my research area.	disagree: _1_2_3_4_5_6_7_: agree
8. Most researchers in my discipline regularly publish articles in refereed journals.	disagree: _1_2_3_4_5_6_7_: agree
9. Most researchers in my discipline regularly present at refereed conferences.	disagree: _1_2_3_4_5_6_7_: agree

Again, in the next sets of questions, please indicate to what extent you agree with the following statements related to doing research and publishing or presenting academic papers by circling the number that best describes your personal opinions.

Statement 3	
1. I have the ability to publish at least one high-level peer - reviewed paper in the next year.	unlikely: _1_2_3_4_5_6_7_: likely
2. For me to publish a minimum of one peer-reviewed paper in a year, would be	difficult: _1_2_3_4_5_6_7_: easy
3. I have the resources,knowledge and ability to share my research knowledge with others.	disagree: _1_2_3_4_5_6_7_: agree
4. If I wanted to, I could access resources to upgrade my research knowledge.	unlikely: _1_2_3_4_5_6_7_: likely
5. I have the resources, knowledge, and ability to enhance my research skill.	disagree: _1_2_3_4_5_6_7_: agree
6. My ability to publish at least one paper in a year is under my control.	disagree: _1_2_3_4_5_6_7_: agree
7. I have the ability to present my work at an academic conference.	unlikely: _1_2_3_4_5_6_7_: likely

Statement 4	
1. I intend to publish a minimum of one peer-reviewed paper within the next year.	disagree: _1_2_3_4_5_6_7_: agree
2. I will make publishing at least one peer-reviewed paper a priority.	disagree: _1_2_3_4_5_6_7_: agree
3. Over the next year, I intend to share my research knowledge with my departmental and other relevant colleagues.	disagree: _1_2_3_4_5_6_7_: agree
4. Over the next year, I plan to update my knowledge of my field by attending one or more research-related conferences.	disagree: _1_2_3_4_5_6_7_: agree
5. Over the next year, to improve my research knowledge, I will read and think about new ideas.	disagree: _1_2_3_4_5_6_7_: agree
6. Over the next year, I will critically analyze new information about my research area to see if it should influence what I do.	disagree: _1_2_3_4_5_6_7_: agree
7. Over the next year, I will participate in informal meetings, conferences, competitions or expositions related to my research areas.	likely: _1_2_3_4_5_6_7_: unlikely

The next set of established standardized questions asks you to provide us with an idea of how you view yourself. Although the list is somewhat long, the items can be answered relatively quickly. Please describe yourself as you are now, not as you wish to be in the future. Express yourself as you honestly see yourself, concerning other people you know of the same sex as you are, and roughly your same age. So that you can describe yourself in an honest manner, your responses will be kept in absolute confidence.

Indicate for each statement whether it is 1. Not accurate, 2. Moderately inaccurate,
3. Neither accurate nor inaccurate, 4. Moderately accurate, or 5. Very accurate as a description of you.

	I see myself as someone who (is):	Not accurate (1)	Moderately inaccurate (2)	Neither accurate nor inaccurate (3)	Moderately accurate (4)	Very Accurate (5)
1.	Full of energy/ life of the party.					
2.	Feel little concern for others.					
3.	Always prepared.					
4.	Get stressed out easily.					
5.	Have a rich vocabulary.					
6.	Doesn't talk a lot.					
7.	Interested in people.					
8.	Leaves my belongings around.					
9.	Relaxed most of the time.					
10.	Has difficulty understanding abstract ideas.					
11.	Feels comfortable around people.					
12.	Insults people.					
13.	Pays attention to details.					
14.	Worries about things.					
15.	Has a vivid/high imagination.					
16.	Keeps in the background.					
17.	Sympathizes with others' feelings.					
18.	Makes a mess of things.					
19.	Seldom feels blue.					
20.	Not interested in abstract ideas.					
21.	Starts conversations.					
22.	Not interested in other people's problems.					
23.	Gets chores done right away.					
24.	Easily disturbed.					
25.	Has excellent ideas.					
26.	Has little to say.					
27.	Has a soft heart.					
28.	Often forgets to put things back in their proper place.					
29.	Gets upset easily.					
30.	Does not have a good imagination.					

I see myself as someone who (is):		Not accurate (1)	Moderately inaccurate (2)	Neither accurate nor inaccurate (3)	Moderately accurate (4)	Very Accurate (5)
31.	Talks to a lot of different people at parties.					
32.	Not really interested in others.					
33.	Likes order/ organization.					
34.	Changes my mood a lot.					
35.	Quick to understand things.					
36.	Doesn't like to draw attention to myself.					
37.	Takes time out for others.					
38.	Shirks/ neglects my duties.					
39.	Has frequent mood swings.					
40.	Uses difficult words.					
41.	Doesn't mind being the center of attention.					
42.	Feels others' emotions.					
43.	Follows a schedule.					
44.	Gets irritated easily.					
45.	Spends time reflecting on things.					
46.	Quiet around strangers.					
47.	Makes people feel at ease.					
48.	Exacting in my work.					
49.	Often/ always feels blue.					
50.	Full of ideas.					

The last set of items deals with your knowledge productivity. Please think about your **knowledge activities over the past 12 months until recently**. Please indicate how frequently you have engaged in each of the following activities by circling the relevant number on the response scale**.**

Please indicate how frequently **over the past 12 months** you have engaged in the following knowledge acquisition activities, by circling the relevant number on the response scale**.**	Not at all (1)	1-2 times this past 12 months (2)	1-2 times per semester (3)	1-2 times most months (4)	1-2 times most weeks (5)
1. I read professional journals and similar sources to acquaint myself with new ideas that might be relevant to my research interests.	1	2	3	4	5
2. I attended a professional conference to keep current with what is happening in my research areas.	1	2	3	4	5
3. I spoke with researchers inside or outside of my institution to determine what is new in my area of expertise.	1	2	3	4	5
4. I attended workshops or training to learn new research-related skills or content.	1	2	3	4	5

Please indicate how frequently **over the past 12 months** you have engaged in the following knowledge sharing activities, by circling the relevant number on the response scale**.**	Not at all (1)	1-2 times this past 12 months (2)	1-2 times per semester (3)	1-2 times most months (4)	1-2 times most weeks (5)
1. I share academic knowledge and research experiences through informal discussions	1	2	3	4	5
2. I shared my research experiences with my colleagues/research partners.	1	2	3	4	5
3. I informed my colleagues about new ideas, methods and research skills.	1	2	3	4	5
4. I shared my research documents with my colleagues/research partners.	1	2	3	4	5
5. I shared my expertise from my research training with my colleagues/research partners.	1	2	3	4	5
6. I got new thoughts from brainstorming with my colleagues/research partners.	1	2	3	4	5
7. I sought colleagues out for advice on a project I was working currently.	1	2	3	4	5
8. I shared work-in-progress with my colleagues/research partners.	1	2	3	4	5

Please indicate how frequently **over the past 12 months** you have engaged in the following activities by circling the relevant number on the response scale.	Not at all (1)	1-2 times this past 12 months (2)	1-2 times per semester (3)	1-2 times most months (4)	1-2 times most weeks (5)
1. I worked on one or more reports of research findings that are intended for submission to an academic journal.	1	2	3	4	5
2. I worked on one or more books or book chapters reporting my research findings.	1	2	3	4	5
3. I submitted one or more papers to an academic conference.	1	2	3	4	5
4. I submitted one or more papers to a journal.	1	2	3	4	5
5. I revised one or more papers that have received a journal review.	1	2	3	4	5
6. I presented one or more papers at an academic conference.	1	2	3	4	5
7. I had one or more papers article accepted.	1	2	3	4	5

Please give your answer by specifying in the appropriate boxes.	
8. Within the past year, I joined or maintained a membership in a professional organization to keep current with new research directions.	Yes: ☐ No: ☐
9. Over the past academic year, how many paper presentations at an academic conference did you have?	
10. Over the past academic year, how many accepted journal articles did you have?	
11. How many of these were in high quality, peer-reviewed journals?	
12. Did you have any other major academic research outputs during the past academic year? (e.g. patents, books, etc.) Please specify.	

a) Please note any factors that you believe are important for encouraging and supporting you to present and publish in high impact conferences and journals.

_____
_____
_____
_____

b) Please note any factors that you believe create barriers against your present and publish in high impact conferences and journals.

_____
_____
_____
_____

End of Questionnaire

"Your cooperation is gratefully appreciated."

APPENDIX 4: FOLLOW UP STUDY QUESTIONNAIRE

Dear respected respondents,

My name is Shahira, and I am a postgraduate student at Durham University. Last November 2016, most of you responded to a study on "The joint effects of personality & behavioural intentions on academic knowledge activities and productivity behaviours: Academicians in HEIs Malaysia". The current survey builds on the first survey to collect measures of the Knowledge Productivity Behaviours you actually engaged in following the first survey. I am inviting you again to participate in this study by completing the second survey. The current survey is much shorter approximately 10-15 minutes to complete. Your voluntary responses will be kept private and will be utilised for education and research purpose only. Thank you for your assistance in this important endeavour. If you require additional information or have questions, please contact me at the number listed below.

Sincerely yours,
Siti Nur Shahira Binti Dahari
(+60127807803 / dahari.s.shahira@durham.ac.uk)

DEMOGRAPHIC INFORMATION:
Please give your answer by specifying or ticking the appropriate boxes.

1. Gender:
   - ☐ Male
   - ☐ Female
2. Please indicate your age: _____
3. Highest academic qualification
   - ☐ Bachelor degree
   - ☐ Master
   - ☐ Doctorate
4. What is the year of your first academic appointment? (this might be at another institution) _____
5. Years of services in UiTM: _____
6. Faculty Position:
   - ☐ Academic Staff - Admin
   - ☐ Academic Staff - NonAdmin
7. Position Grade:
   - ☐ Part time/ Full Time Lecturer
   - ☐ Contract Lecturer
   - ☐ Lecturer
   - ☐ Senior Lecturer
   - ☐ Associate Professor
   - ☐ Professor
   - ☐ Other (please specify _____
8. Teaching:
   - ☐ Undergraduate only
   - ☐ Postgraduate only
   - ☐ Undergraduate and postgraduate
9. Supervision of students' theses and dissertations:
   - ☐ Yes, undergraduate only
     If yes, please indicate how many students this year; _____
   - ☐ Yes, postgraduate only
     If yes, please indicate how many students this year; _____
   - ☐ Yes both undergraduate & postgraduate
     If yes, please indicate how many students this year; _____
   - ☐ None
10. Faculty/ School:
    - ☐ Social Sciences
    - ☐ Science & Technology

The following set of items deals with your knowledge productivity. Please think about your **knowledge activities over the past 12 months till recently**. Please indicate how frequently you have engaged in the following activities by circling on the appropriate scale**.**

Please indicate how frequently you have engaged in the following activities by circling on the appropriate scales**. Your knowledge acquisition over the past 12 months till recently:**	Not at all (1)	1-2 times this past 12 months (2)	1-2 times per semester (3)	1-2 times most months (4)	1-2 times most weeks (5)
1. I read professional journals and similar sources to acquaint myself with new ideas that might be relevant to my research interests.	1	2	3	4	5
2. I attended a professional conference to keep current with what is happening in my research areas.	1	2	3	4	5
3. I spoke with researchers inside or outside of my institution to determine what is new in my area of expertise.	1	2	3	4	5
4. I attended workshops or training to learn new research-related skills or content.	1	2	3	4	5

Please indicate how frequently you have engaged in the following activities by circling on the appropriate scales. **Your knowledge sharing over the past 12 months till recently:**	Not at all (1)	1-2 times this past 12 months (2)	1-2 times per semester (3)	1-2 times most months (4)	1-2 times most weeks (5)
1. I share academic knowledge and research experiences through informal discussions	1	2	3	4	5
2. I shared my research experiences with my colleagues/research partners.	1	2	3	4	5
3. I informed my colleagues about new ideas, methods and research skills.	1	2	3	4	5
4. I shared my research documents with my colleagues/research partners.	1	2	3	4	5
5. I shared my expertise from my research training with my colleagues/research partners.	1	2	3	4	5
6. I got new thoughts from brainstorming with my colleagues/research partners.	1	2	3	4	5
7. I sought colleagues out for advice on a project I was working currently.	1	2	3	4	5
8. I shared work-in-progress with my colleagues/research partners.	1	2	3	4	5

Please indicate how frequently you have engaged in the following activities by circling on the appropriate scales. **Your knowledge transfer over the past 12 months till recently**	Not at all (1)	1-2 times this past 12 months (2)	1-2 times per semester (3)	1-2 times most months (4)	1-2 times most weeks (5)
1. I worked on one or more reports of research findings that are intended for submission to an academic journal.	1	2	3	4	5
2. I worked on one or more books or book chapters reporting my research findings.	1	2	3	4	5
3. I submitted one or more papers to an academic conference.	1	2	3	4	5
4. I submitted one or more papers to a journal.	1	2	3	4	5
5. I revised one or more papers that have received a journal review.	1	2	3	4	5
6. I presented one or more papers at an academic conference.	1	2	3	4	5
7. I had one or more papers article accepted.	1	2	3	4	5

Please give your answer by specifying in the appropriate boxes.	
8. Over the past 12 months , I joined or maintained a membership in a professional organization to keep current with new research directions.	Yes: ☐ No: ☐
9. Over the past 12 months, how many paper presentations at an academic conference did you have?	
10. Over the past 12 months year, how many accepted journal articles did you have?	
11. How many of these were in high quality, peer-reviewed journals?	
12. Did you have any other major academic research outputs during the past academic year? (e.g. patents, books, etc.) Please specify.	

a) Please note any factors that you believe are important for encouraging and supporting you to present and publish in high impact conferences and journals.

b) Please note any factors that you believe create barriers against your present and publish in high impact conferences and journals.

End of Questionnaire

"Your cooperation is gratefully appreciated."

APPENDIX 5: INTERVIEWS

PART 1										
No	Time	Post	Admin	School	Age	1.Importance of R&P	2. Main factors	3.Expectation	4.R&P changes overtime	5. Promoted R&P changes
1	8:04	SL	None	IM	55+	Yes, academic need research. For career and add knowledge.	Self-development Career enhancement Self-satisfaction doing rnp.	Career enhancement.	Publications nowadays need to have more impact to society and country.	If being promoted rnp should be more towards, suited needs user and shareholder, give back to society.
2	9:25	SL	HM	IM	40+	Yes, it is important for my career as a lecturer.	For knowledge I enjoy to share my research findings.	For career, its important criteria for career promotion.	Yes, especially during my phd time it has change the way I do my research.	Nothing changes, I still do my research, but in a slow phase as I have given administrative position in my faculty.
3	11:25	SL	HM	Art	40+	Yes, rnp is important path for academic.	Recognition been acknowledge by society and other researchers through journals and been cited. For career development.	For career development.	Yes, topic chosen need to be on trend.	If being promoted, they will be more responsibility given such as administrative duties, time for rnp will be limited this happen to me, but I try my best to do it.
4	18:57	SL	HM	IM	40+	Yes rnp is one of importance factor to develop our professionalism.	Grant availability.	First is career confirmation, second for knowledge competency. Thirdly, sharing the findings with others and students.	There is a change in rnp, especially publication in hi-index journal has been put on attention compared to 10 years back.	Yes drastically, as a rector I don't have enough time to focus on rnp, my focus more towards management and campus administrative.
5	5:17	L	None	BM	30+	Yes, for my career development.	SKT (performance appraisal), career	Career promotion.	Yes, in term of grant.	Yes, need to attend conference and publication

							promotion and upgrade my skills and knowledge.			
6	5:13	L	None	IM	30+	Yes, for my career development.	Grant and facilities.	Upgrade my knowledge and for my career development.	Yes, budget for rnp has been limited.	Yes, I have to involve in rnp more.
7	4:43	L	None	BM	30+	Yes, for my career development and upgrade my knowledge.	Grant and financial. Reduce teaching load.	Able to publish in hi index journals.	Yes, upgrading my knowledge and skills in rnp.	Yes, the way I write might changes.
8	5:08	L	None	OM	30+	Yes, it is requirement for academic and for career development.	Requirement by the uni for career development, promotion.	Career development and additional knowledge and enhance self-esteem.	Yes, budget allocation been reduce and a lots of competition to apply.	Yes, higher expectation from others, thus need to produce more rnp.
9	5:08	L	None	IM	30+	Yes, it is requirement for academic and for career development. Be more knowledgeable.	Requirement as lecturers. That is part of our duty. For career development.	Add and upgrade knowledge.	Yes, look at requirement of the uni. Need to publish in hi-index journals. Methodology part keep on changes	Yes, the duty will be expand for example consultation with the society.
10	7:51	SL	None	CS&M	40+	Yes, it is requirement for academic and it can add and upgrade our knowledge.	I enjoy explore new things. It will give me satisfaction.	Self-satisfaction Recognition from peers and help others with our expertise.	Yes, my field in IT, IT development and growth fast changes. We need to cope with the changes.	Yes, be more active in rnp.
11	16:15	L	HM	IM	30+	Yes, it is requirement for academic to carry out the rnp and knowledge activities.	One of them are for job promotion, enhancement of knowledge and especially research that focus on Malaysia	Research that focus on Malaysia case studies, which can give contribution	Yes, especially during process of data analysis. Today there is a lot of software availability and rapid changes of technology.	Even you have been promoted the rnp activities should not be stop, it should be done actively.

							case studies, which can give contribution back to the country development.	back to the country development.		
12	10:46	SL	HM	Lgg	30+	Yes obviously, especially to my academic part. It will enlighten me as academics.	Firstly, promotion it's self. Secondly, scholarship. Thirdly is recognition from others, look good in term of the scholar	More rnp look good in term our knowledge and ourself as academic and known more by others, get recognition from others.	Yes, surrounding and influences from others. Our peers can influence the rnp activities.	Yes, a lot in term of seniority you will have more responsibility, example when we get promoted, previously teaching diploma student/class upgrade to degree/bachelor class.
13	6:19	L	None	Eco	30+	Yes, for career and knowledge.	Support from uni example scholarship and grant.	My rnp could be references to others and students.	Yes, there will be new things new rnd. So we need to cope with time also.	Yes, be more active and productive in rnp.
14	7:24	SL	None	IM	30+	Yes, it a must for lecturers. As academic we need to equip and upgrade our knowledge as according to time.	Get new findings. Get incentive. Get grant. Networking, get to know many other expertises.	Get our research been recognise from other people.	Yes, definitely as time changes technology also change. The data analysis way also has changed. Back days we have SPSS software, now SmartPLS and R-programming software to look into varies of variables.	Yes, for me it's hard to get grant but for applying process (grant application) much easier.
15	6:17	SL	None	PA	40+	Yes, it a must for academic, why? because it is one of the element of career advancement.	I can go for conference and meet new people.	Get new findings. Get new input and comments when you go to conferences.	Yes, the way you do research, the changes in methodology part.	Yes, sometimes changes in terms of the requirement in academic line (university).

16	7:08	SL	HM	IM	40+	Yes, it is very important in academic line. Through rnp it can upgrade our knowledge for the purpose of tnl.	Main factor, to add our knowledge especially in the teaching subject.	When we do rnp in the our own fields it helps us in tnl as well, for example I am teaching IT subject, so I will know what is the latest IT.	Yes, rnp should change according the time and technology. For example, previously we use questionnaire printed nowadays we can do it online.	Being promoted also influences rnp. Changes in accordance to KPI (Key performance indicator). It can change/ lesser your teaching load if you have research factors.
17	14:09	SL	None	PA	40+	Yes, for career. For lecturer we have to have rnp for our continuous output, and to upgrade our knowledge. And if we don't have any research means that we do not follow current trend and not in touch with our surrounding. Moreover if we do not publish means we do not validate our output from the research. Therefore it is important to have both rnp.	Main factor is the career itself. As a lecturer we need to be well inform (awareness in the field) for teaching purpose and to stay in the industry. To get response from the industry or to discuss with colleagues we need to have knowledge which could be gather from rnp.	Im hoping that from my rnp, it will get accepted and understood from the readers and will benefits them. My research will get accepted by the experts in the fields. Get acknowledgment and recognition from the expertise and as added value and for networking.	Ten years ago, during that time in term of resource accessing is very limited for example internet. But today there's a lot of resources availability and sharing medium for research activities and all the process involves are much more direct and fast, accessibility and supporting tools much more efficient. In term of experience, there's a lot changes in content wise, methodology used, and I am sure in next ten years there will be other changes. It's an evolving process	As I have been promoted for me there is no extreme change.
18	7:32	L	None	CS	30+	Rnp is important factor,	My main factor for	I am hoping that	Yes, rnp activities are	Yes, if I have been promoted,

						it is one of the merit, the more you have rnp activities the more merit or marks it will help you in your job promotion.	doing rnp, is for job promotion.	from my rnp will benefits and help the readers and other researchers.	changing based on format, your research studies and current issues.	my rnp will change because the merits for next job promotion need more rnp activities involvement.
19	5:57	SL	None	CS	30+	Yes, it is important, as a lecturer. In order to share and build up new knowledge we have to do research.	First going to conference. Secondly share knowledge. Thirdly meet new people, networking and do collaboration.	For my self-enhancement, and enhance my h-index in google and etc.	Yes, the changes in term of hi index journals, nowadays the focus is more towards hi index journal, scopus, isi and etc.	I felt the same, because as an academic, currently you are doing journal, rnp, in future also you have to do it.
20	8:03	L	None	OM	30+	Yes, it is important, as an educator we need to have publication and involves in research activities.	For finishing the grant given and job appraisal.	To get more experience.	Yes, the process of developing the research proposal much easier as we have been trough training.	If being promoted and the teaching loading are reduced maybe there will be changes. If not it will remain the same.
21	5:35	L	None	OM	30+	Yes it is important, as a lecturer we need to have publication and involves in research activities. So that we can established our self.	It is our duty as a lecturer as rnp is important factors in our career. Next for job appraisal requires us to have rnp.	Our research is being appreciated and benefits to others, and we could share the knowledge with people.	A lot, among of them my research is more structured. My colleagues, environment surrounding me influence my writings.	No, as a lecturer even we have been promoted rnp should be the same or improves.
22	10:50	L	None	BM	30+	Yes, it is important especially towards lectures nowadays.	To get new findings and job promotion.	It (rnp) can benefit to all of us and for future generations.	Yes, topic chosen for our studies need to suits the current time.	Maybe, if we get promoted our networking will be different more expandable. More communication involves will lead to more choices of topic to be chosen. Changes in terms of

										networking.
23	6:36	L	None	PA	30+	Yes, it is. As a lecturer it is our duty to explore and adding up our knowledge and knowledge in our discipline.	As the development of renaissance in the 15th century, the Spirit of enquires influence me to do rnp in my career development.	Expanding my knowledge and increase growth of interest of rnp especially among academics.	Yes, it has affect especially the changes of requirement of the university.	Yes, rnp will change for example time focus will be allocated more for rnp.
24	27:13	SL	HM	OM	40+	Yes in career of lecturer, rnp is important. Regardless in what capacity, lecturers need to involve in rnp because it is one of our track to enhance our career.	Firstly, look at the capacity of the lecturers, if look at the lecturer with admininistrative context, the focus, time and task towards rnp are limited. In terms of motivation, the uni and government has provided a lot of motivation facilities and needs on rnp activities.	To give new ideas, to offer solution towards issues. Rnp also need to suit with the need of current time and issues regarding country, society or university.	Not only been published but also the study should give impact towards society and uni.	When we involve in administrative duties and being promoted, yes there will be a restraint in terms of time allocation. But again look at the track chosen. If its rnp track, it (lecturer) should be more motivated to do research as there will be more opportunities for them. But if its admininistrative track, the time to focus on rnp will be divided and focus more on administrative task. But we can't escape from rnp activities, it is much better if we get involves. For example join in the research team but not as the team leader. So even we are in administrative track, we do not leave out rnp at all.

PART 2							
No	6.R&P challenges	7.Teaching challenges	8.Productive researcher	9.Department support	10.Suggestion for uni improvement	11.Uni focus	12.Success researcher
1	In term of research, time allocation is limited plus we need to teach. In terms of publication lack of journal publish in my area.	Directly no, indirectly yes by doing research not in your teaching area or expert it will make it even harder.	Do research that able to give back to society. Research contribution towards society.	Support yes, motivate not so much.	Lecturer that have expertise, or have doctorate should lead the research team, not appointed as admin task.	Depends on the university objective itself. I can't comment much on that.	No I don't think so, based on my research that has been done, it didn't give back to the society or being commercial. It is not being used by the society.
2	Firstly, finding suitable method for my study. Secondly, if there is new method I need to learn Thirdly, topic chosen Fourthly, writing up process. And lastly, difficulty to get publish in core journal	Personally no. Two of them; teach and research correlates and complement each other. In order for you to lecture and share knowledge you have to do research.	From experience you need to read a lot.	Yes. We support and encourage the rnp activities including IM faculty.	The process of grant application should been simplified.	Yes, element of rnp should have in every universities, beside teaching and learning.	No comment, I will let other to judges on that. Maybe I see myself as a moderate researcher.
3	Firstly, to obtain grant. Secondly, to publish in core journal Thirdly, time given	No. As it is our responsibility as academic.	In term of facilities for example provide faster internet access and language editing services.	Yes. Example as a HoF I encourage my staff to do research that related to their subject.	UiTM press need to be more active. Give more motivational factors for example give extrinsic motivation for	Yes, because that is one of the criteria for world university ranking.	Successful no but I'm trying to be success researcher not only in my field but also cross field too.

	for publishing		Be able to penetrate and publish in acknowledge journals.		example rewards.		
4	Difficulty in getting the right respondents. Insufficient funded received. Publication accepted difficulty	No, it's works together. Through research you can upgrade your TnL. And as academic responsibility.	Management need to support and give motivation to encourage lecturers to be more productive such as held workshop and courses related with rnp.	Yes there is support and motivation.	Firstly, chosen the right team members. Secondly, chosen topic is important Thirdly, have knowledge on methodology skills	Look at the mission of the university. In uitm context, main campus in s.alam and puncak alam more focus on research activities. For campus branch we much focus on tnl but attention to research also is needed but the weighted is different with the main campus.	For fifteen years as a lecturer in tnl university, my tendency is more towards tnl. I see myself more as lecturer than researcher. But nevertheless I try to do both.
5	Grant for rnp activities	Yes, given a lot of teaching loads might affect the rnp activities.	Practice a lot in rnp activities.	Yes, there's a lot of programme and activities for writing and publication in my department	Reduce teaching load. Grant availability.	Yes, to be a research university, we need to focus on rnp.	Not yet I only publish few journals.
6	Lack of grant.	Yes, when involves in rnp we need to give more focus and attention. Teaching load need to be reduced.	Facilities and seminar provided.	Yes, there's knowledge sharing session held in my department.	More facilities and more budget allocation on rnp activities.	Yes, to achieve RU uni we need to focus on rnp activities.	Not yet, for moment I much focus on tnl activities
7	Teaching load and financial constraints in rnp activities	Yes, a lot of teaching loads given might affect the rnp activities.	More grant availability, Reduce teaching loads and support from HoS and CC	Yes, there is support and motivation.	Reduce teaching load and admin duties.	Yes, to enhance KPI indicators for rnp.	Not yet I only publish few journals.

8	Focus might affects as we need to run tnl activities also.	Yes.	Support in grant, training motivation in rnp and upper management support.	Yes, but there is no support in terms of financial.	Reduce teaching load so lecturer can focus on rnp and more grant availability.	Yes, if they want lecturers to produce more rnp they need to focus more on rnp.	Not yet, maybe one day.
9	Methodology keep on changing therefore we need to have training.	No, for me admin duties are the factors of hindrance not tnl.	If grant easy obtained. Provide training about rnp and support by uni.	Yes, HoF encourages participating in rnp.	More training regards rnp.	Yes, but it is depends on the nature of the university itself.	Not yet.
10	Time to focus on tnl and rnp and understanding new information.	No, for me it's works together. Through research you can upgrade your TnL. For me tnl will motivate you to do research.	Resources, much faster and accessible can make a productive researcher.	Yes, my HoF actively encourages us to participate and collaborate in rnp.	Coordination between colleagues. Good team members will lead you to achieve success.	Yes, for improvement in uni ratings or ranking.	Close to success, as I still need to learn and explore more. Maybe one day.
11	Firstly, financial constraint to support rnp activities example purchase software for data analysis. Secondly, difficulties in getting grant.	No, it just that if the researcher has high 18hours teaching loads they might find it difficult to do rnp, but tnl is not a hindrance for rnp activities.	Strengthen my knowledge in my research data, research analysis. I have to get closer with those who have the expert in the fields, so that I can learn the skill and way (process) in rnp activities.	Yes, my department very much support the rnp.	Link between pji and hof, so that hof have awareness about staff involvement in rnp activities. More financial support for rnp activities.	Yes, as an academic institution we need to. In order to produce more quality researcher. But because of teaching load are mostly equally given to those have research and does not, no lower teaching load to those have research. Yet there is a plan to focus on rnp activities. There will be a track for research, those who prefer this track will	Not yet, it is still far there is lot of things I need to learn, maybe one day.

						have lower teaching load. This track will be implementing only in main campus and not focus in branch.	
12	Time and interest, especially to those who have administrative task, most of the time given focus to admin work. Cost and money.	Yes. The university plan to have research and tnl track. Lesser teaching load will be given to research track. If this will be implement it would be no problem. But now we have to take both, somehow it will influence the rnp activities.	If you have more grants or funds is one of the elements to do research.	Yes, we do have. For language programme, we have implementation of SIG- special interest group we promote and encourage each other to do research. For example my focus is on communication, so those who have same interest will discuss together about grant and fund for rnp activities.	More fund more grant people will do research. And provide specific time allocation for rnp, and allowing sabbatical and attachment with other universities. Provide study leave for doing research and give awards for best researcher and publication annually twice a year.	Obviously, rnp is the main core of university development, Qs rank world Ranking universities they are dealing with rnp, but at the same time we have to be together with the student development (tnl). We can't run from that.	Moving towards it, because I have been awarded the best new lecturers in uitm for 2016, because I got few research grants almost RM85, 000 so I am doing the research right now. Not so called as successful but I am moving towards it. Maybe one day I will take research activities as priority in my academic life.
13	Lots of classes. Time constraint. Grant or fund constraint.	No, that is our priority then if we have time we focus on rnp.	Resources, much faster and accessible. More grant.	Yes, there is award given and support from the management and faculty.	Upgrade facilities for sources. More time given and reduce little bit on teaching load Grant and funds.	Yes, sure it is important but it needs to be and work together with tnl.	Not yet, maybe one day.
14	In terms of data collection and culture differences. Publication	I don't find it as a hindrance. Tnl and rnp should be done simultaneously.	Maybe introduction to new and interesting field. More new	Yes, definitely support. Example if I need permission to be outside of the campus for my rnp	For the moment more research grants.	In my personal view, it is a must. Uitm in branch campus we are tnl uni, because from new findings we can share	I am still a learning researcher. Everyday there is new changes and I still need to learn a

	requirement from universities. Nowadays trending in high-index publication may increase our h-index and recognition. But sometimes some particular journals requires fund to publish.		approach and interesting data analysis. Or trend of student behaviour changes.	activities for data collection or presenting in conferences the faculty shows support and help, no restriction from my department.		with students. And increase student interest for learning and sharing knowledge sessions.	lot of things.
15	The main challenge is in terms of financial. Especially now, the fund allocation has been cut down and limited to compare with previous time. Maybe this happens because of government and university financial constraint. If we want to do it we have to use our own money, which is limitation to ourselves.	I don't find it as a hindrance. This is because as we do research, the output that we get from the study could be share together with the students. Sometimes during teaching and learning session we could come out with a lot of ideas (rnp) with the student.	More fund availability.	Yes, very much, from the top management dean, HoS and my colleagues give support and motivation in rnp. Continuous support will be a culture towards rnp culture.	We have to support each other in doing research and give cooperation.	Focus yes, but not a priority as uitm is a tnl university.	Not yet. Everyday there is new changes and I still need to learn a lot of things. It is a ongoing learning process.

16	Main challenges are cost and budget. To get feedback or information from respondent for your research.	Yes, if we have high teaching loads 15-18 hours it might be a hindrance.	Support from the faculty, if we can have lesser or reduce teaching load it will not burden the lecturers to do both.	Yes, department shows support in rnp activities, as long as the rnp is registered in irmis or pji. If rnp is being registered all rnp matters are regards as official matters.	For me those lecturers who actively participate in research and publication should be given a little bit of incentive or rewards, not in terms of financially but it also can be in terms of career promotion and reduce teaching load because they are actively involved in research and publication activities.	Yes it should have focus but it need to be balance between research publication and teaching learning activities.	For the moment not yet.
17	When I was a lecturer (dm45), the challenge would be lack of experience. But as rnp usually being conducted in a team my collegues and senior are there to help us. Today challenges would be as I have gain few experiences in doing research are in terms of funding. The	It is not a hindrance. But in term of time division maybe can be a challenge. Because of our main core is tnl so it will requires us a lot of time example like marking. In addition to that rnp also require alots of works. Therefore it is a challenge but not a barrier.	It would help to have a good assistant. My own attitude itself. My team are very helpful.Facilities are very supportive. Time management with myself are very important as I have a lots of other duties to be done.	Yes, my hof very supportive, always remind us about the importance of having grant and rnp. It just that, in uitm kedah itself, the medium of research grant awareness is there but are not being promoted or spread out extensively. From colleagues view the research attitude is lacking, because most of them full loads with	I think, the universities need to do a lot of enforcement or persuasion by giving training and workshop. In my past experience I have attend a lot of workshop, from there the interest growth, it's fun to do research. And for attitude we can hold seminar to encourage them.	Yes. As our university has listed in QS rank, in order to maintain or to improve on top we need to focus on research and publication activities. I think a little more focus on research and publication can be done even though we are currently teaching and learning university.	No, but aspiring yes.

	resources are there but it is limited and you have to compete with others so that is the problem. Other than that online resources are very supportive just lack of financial opportunities.			teachings activities.			
18	My main challenges were in term of financial constraint. Even you get funded the funds allocated is not sufficient enough. Thus sample being applied in the study based on the fund and the scope of the study also became limited.	For me, I enjoy teaching more than rnp. But as rnp is one of the main factors as a lecturer, thus I still do rnp activities.	Firstly, to have a responsible team members which can give ideas, inspiration and able to complete the research. Secondly, able to produce new knowledge where your research fit along the time meaning that able to solves recent issues.	Yes, my department really emphasis on rnp even there always set up a discussion and plan collaboration for those who does not have any fund for rnp.	No comment.	For me rnp is really important, therefore I agreed the university need to focus on rnp. Reducing teaching load may able lecturers to have adequate time to focus on rnp.	No I don't think so, because right now I have other duties as auditor and also teaching and learning activities. Therefore I have limit time.
19	Firstly, the challenges are in terms of financial and secondly the process of getting the grant. It is	If the teaching load is too much, it can affect the time and concentration on research and publication	Team work with other colleagues from other universities. Join reputable Professor, so that	Yes, my HoS really support. For example giving permission for conferences and for data collections.	University need to simplified the fund process for lecturers. For example easier fund process for rnp activities.	To improve the university ranking, it is a must. So that our rnp can be improved. Otherwise the ranking will drop off.	For the moment not yet, maybe one day after I have completed my PHD.

	hard to get the government grant, that's the main challenges.	activities. In uitm the teaching load up to 18hours, thus limited time for research. But nevertheless we try to do it in one year period of time.	we can produce more publication.				
20	For research activities it will be hard to do it if we don't get the grant. The process of getting the grant and during data collection also seems hard for me. That's the challenges that I have faced.	Yes, because it require a lot of time to prepare for class doing marking, assessment, advisor for students and etc, especially if you have a lot of teaching load and involves in administration duties. It would be better if the teaching loads are being reduced.	We have to have support groups. Peers influence, if we do not have any colleagues that want to do rnp it might affects on us, not productive as well.	Support yes, but less motivation.	Yes, in terms of budget, small allocation is being provided it is not adequate. Financial constraint. Uni should provide more budget and allocation on rnp.	If as research university it is yes, but as for uitm we more focus on tnl.	I am not a successful research as there is a lot of other factors might be restraint FOR me, but I am heading to be.
21	Firstly, the challenges are in terms of financial grant and etc. Secondly, in my view, research often been done in a team its hard	No, I don't see teaching as an obstacle, again as I have mentioned earlier, as an academic doing research is one of our criteria.	Support group.	Yes, such as give awareness about new grant, especially from senior lecturers.	Firstly increase funds. Secondly after doing research, held a colloquium through that we can see the culture of research activities in the uni. Otherwise,	Yes, if we want to increase the QS ranking, we have to produce research.	Not yet, there are still a lot of things I need to go through.

	doing it individually therefore the other challenges would be in terms of choosing and inviting team members its quite difficult as their might have other responsibilities to do.				people do not know the existence of our paper. Thirdly, in the website in lecturer profile section list all the lecturer publications.		
22	For the moment my track is not research, a lot of other uni/ official task that I need to do. Maybe in term of time constraint. We have to teach and do research at the same time. As a LI Coordinator I need to consult my student. So all the above are the constraint for me to focus on rnp.	In term of time yes, but actually it is not rnp helps in our teaching indirectly get new ideas for rnp.	Maybe reward. Sometimes when you produce a good research you aim to finish and keep it to yourself, it does not benefits to others.	In my department, a few encourages rnp but not everyone support rnp as they thought you are not interested in rnp. Because doing rnp you need patience and put lots of efforts in finish it. There are activities such as conducting conferences and etc, but it need commitment from everyone. Thus everyone have to play their own role to make sure the conference is success.	Motivation and awareness, I think the university need to give ongoing and repetitive motivation and encouragement in doing research and publication. That will boost their spirit in doing research and publication.	If the university want to compete in uni ranking, QS university, such as USM and other university, it is very important to have rnp. But going back to uitm objectives is to enhance bumiputera. For me if the uni chose to focus on rnp. Theres should be more encourage on rnp activities. And rewards to can encourage rnp.	For the moment not yet, for me to be a successful, if the lecturers could produce ten or more publication I will considered as successful. Once or twice a month must have paper produce. Just like USM practices, but again their teaching load is less such as 6 to 8hours teaching load to compare with us up to 18 hours. Again apart of time constraint for me motivation factors

							is important in rnp.
23	Firstly is the bureucracy especially in gathering the data. Secondly Is the funding, not many grant available since the economy of the country not so well.	Basically it is compliance to rnp. It has to do simultaneously together.	To get student involves in research activities, indirectly will benefits and give input for the students and researcher itself.	Yes my department very supportive in rnp as long as it meets the needs of the uni.	The university should continuously give support logistically, grant and reduction in teaching.	Yes, I agreed uni need to focus on rnp without neglecting tnl.	No comment.
24	In terms of fund itself. Specific time given to complete the research and publication. Constraint in terms of corporation given or even respondent.	In the uni context, it has 4 track, tnl, kepimpinan academic, professional track and research. For RU uni maybe they will not face it as a problem. But for tnl uni, it will be little barrier to do rnp. But if you look at the positive way, actually tnl and rnp move together. In uni a lot of advice and motivation given to lecturers in doing research that can benefits their tnl as well. So	As our country is moving towards to be develop country, thus we need to look into the context or opportunities that we have in order to help enhancement of our country and our universities. A lot of new areas which can be explore, so that it can help to enhance our research quality and activities. Indirectly we can give contribution back to our	Yes in my faculty context there are no issues in support and motivation context. Because we have our own KPI, which meets the KPI of university objective and quality. In my faculty, BM is the biggest faculty in uitm kedah, thus we need to give more contribution towards KPI and uni objectives and quality. Activities that support rnp is being held such as colloquium and seminar.	In university, we have provided a KCM fund, the scale of the fund need to be enhanced or expand. If everyone is allocated with fund, I think we can increase our rnp. Now HEA more research based on tnl are been emphasis more.	The university has choice, because uni is an important institution to help the government in developing the countries. One of the important things based on research and publication, focus on rnp should be given. Those in tnl track may find it as a constraint thus encouragement especially should be given to those in rnp track. And be moderate in term of the scale or requirement. When research has become a culture in every lecturer,	Looking at my context as the deputy rector, my involvement in rnp is limited. But looking at my twenty two years career, after finish my phd I involves in rnp. But still now the involvement is there but it limited, not as team leader but a part of research team. I have been trough all the phase, I can see myself as successful researcher but not victorious or great.

		it's not a hindrance if look at the positive way.	country.			therefore they are aware of rnp importance. They will felt more awareness, openness and willingness and give commitment in rnp. Overall, even we are comprehensive uni, commitment to rnp should be given other than tnl.	

APPENDIX 8: SOCIAL SCIENCE SAMPLE: MEASUREMENT MODEL CORRELATIONS (KA, KS & KT)

	2	3	4	5	6	7	8	9	10	11	12
Big Five											
1. Extraversion	.49	.24	.24	.45	.24	.20	.20	.22	.29	.30	.19
2. Agreeableness	---	.63	.36	.55	.30	.28	.32	.30	.15	.23	.08
3. Conscientiousness		---	.42	.60	.25	.32	.23	.29	.21	.20	.11
4. Emotional Stability			---	.30	.08	.12	.13	.11	.14	.13	-.002
5.Openness				---	.38	.44	.24	.30	.45	.46	.31
Theory Planned Behaviour											
6. Intention					---	.78	.66	.73	.51	.43	.41
7. PBC						---	.63	.60	.61	.47	.55
8. Subjective Norm							---	.75	.43	.39	.31
9. Attitude								---	.44	.37	.34
Knowledge Productivity Behaviour											
10. Knowledge Acquisition									---	.87	.81
11. Knowledge Sharing											.72
12. Knowledge Transfer											

APPENDIX 9: SCIENCE TECHNOLOGY SAMPLE: MEASUREMENT MODEL CORRELATIONS (KA, KS & KT)

	2	3	4	5	6	7	8	9	10	11	12
Big Five											
1. Extraversion	.51	.32	.31	.54	.30	.36	.20	.23	.44	.34	.33
2. Agreeableness	---	.71	.32	.74	.38	.26	.33	.26	.17	.18	.06
3. Conscientiousness		---	.58	.66	.38	.35	.23	.28	.41	.36	.33
4. Emotional Stability			---	.37	.10	.21	.14	.11	.16	.08	.15
5.Openness				---	.35	.51	.25	.33	.48	.41	.37
Theory Planned Behaviour											
6. Intention					---	.70	.60	.63	.44	.48	.45
7. PBC						---	.64	.54	.49	.51	.62
8. Subjective Norm							---	.73	.30	.36	.29
9. Attitude								---	.42	.44	.35
Knowledge Productivity Behaviour											
10. Knowledge Acquisition									---	.79	.67
11. Knowledge Sharing											.67
12. Knowledge Transfer											

APPENDIX 6: TIME 1 SOCIAL SCIENCES SAMPLE

Table 4.22.1 Summary of Hypothesis Testing regarding effects of KPB

	Statement of hypotheses H1a-e (B5)	Standardized effect	Results indicate for higher order KPB
H1a	*Openness has a positive relationship with Knowledge Productivity Behaviour.*	.478	Supported
H1b	*Emotional stability has a positive relationship with Knowledge Productivity Behaviour.*	---	Not supported
H1c	*Extraversion has a positive relationship with Knowledge Productivity Behaviour.*	.177	Supported
H1d	*Agreeableness may have either positive or negative relationships with Knowledge Productivity Behaviour.*	-.180	Supported
H1e	*Conscientiousness has a positive relationship with Knowledge Productivity Behaviour.*	---	Not supported
	Statement of hypotheses H2a-d (TPB)	**Standardized effect**	**Results indicate for higher order KPB**
H2a	*Intention to engage in research activities has a direct, positive effect on Knowledge Productivity Behaviour.*	.516	Supported
H2b	*Attitude towards publishing/presenting has a positive, direct effect on behavioural intention*	.400	Supported
H2c	*Subjective Norms about academic productivity pressure (i.e., peer and superior) have a positive direct effect on behavioural intention.*	---	Not supported
H2d	*Perceived Behavioural Control towards capabilities in publishing has positive direct effects on behavioural intention.*	.547	Supported

Table 4.22.1.1 Summary of Hypothesis H1a-e B5 with KPB construct: KA, KS & KT

	Statement of hypotheses H1a-e B5 with KPB construct: KA	Standardized effect	Results indicate for higher order KPB
H1a	*Openness has a positive relationship with Knowledge Acquisition*	.471	Supported
H1b	*Emotional stability has a positive relationship with Knowledge Acquisition*	---	Not supported
H1c	*Extraversion has a positive relationship with Knowledge Productivity Behaviour*	.172	Supported
H1d	*Agreeableness may have either positive or negative relationships with Knowledge Productivity Behaviour.*	-.192	Supported
H1e	*Conscientiousness has a positive relationship with Knowledge Acquisition*	---	Not supported
	Statement of hypotheses H1a-e B5 with KPB	**Standardized effect**	**Results indicate for higher order**

	construct: KS		KPB
H1a	*Openness has a positive relationship with Knowledge Sharing*	.468	Supported
H1b	*Emotional stability has a positive relationship with Knowledge Sharing*	---	Not supported
H1c	*Extraversion has a positive relationship with Knowledge Productivity Behaviour*	.124	Supported
H1d	*Agreeableness may have either positive or negative relationships with Knowledge Productivity Behaviour.*	---	Not supported
H1e	*Conscientiousness has a positive relationship with Knowledge Sharing*	---	Not supported
	Statement of hypotheses H1a-e B5 with KPB construct: KT	**Standardized effect**	**Results indicate for higher order KPB**
H1a	*Openness has a positive relationship with Knowledge Transfer*	.356	Supported
H1b	*Emotional stability has a positive relationship with Knowledge Transfer*	---	Not Supported
H1c	*Extraversion has a positive relationship with Knowledge Productivity Behaviour*	.126	Supported
H1d	*Agreeableness may have either positive or negative relationships with Knowledge Productivity Behaviour.*	-.136	Supported
H1e	*Conscientiousness has a positive relationship with Knowledge Transfer*	---	Not supported

Table 4.22.1.1.1 Summary of Hypothesis H2a-d TPB with KPB construct: KA, KS & KT

	Statement of hypotheses H2a-d TPB with KPB construct: KA	**Standardized effect**	**Results indicate for higher order KPB**
H2a	*Intention to engage in research activities has a direct, positive effect on Knowledge Acquisition, Knowledge Sharing and Knowledge Transfer.*	.525	Supported
H2b	*Attitude towards publishing/presenting has a positive, direct effect on behavioural intention*	.400	Supported
H2c	*Subjective Norms about academic productivity pressure (i.e., peer and superior) have a positive direct effect on behavioural intention*	---	Not supported
H2d	*Perceived Behavioural Control towards capabilities in publishing has positive direct effects on behavioural intention.*	.547	Supported
	Statement of hypotheses H2a-d TPB with KPB construct: KS	**Standardized effect**	**Results indicate for higher order KPB**
H2a	*Intention to engage in research activities has a direct, positive effect on Knowledge Sharing.*	.443	Supported
H2b	*Attitude towards publishing/presenting has a positive, direct effect on behavioural intention*	.400	Supported
H2c	*Subjective Norms about academic productivity*	---	Not supported

	pressure (i.e., peer and superior) have a positive direct effect on behavioural intention		
H2d	*Perceived Behavioural Control towards capabilities in publishing has positive direct effects on behavioural intention.*	.547	Supported
	Statement of hypotheses H2a-d TPB with KPB construct: KT	**Standardized effect**	**Results indicate for higher order KPB**
H2a	*Intention to engage in research activities has a direct, positive effect on Knowledge Transfer.*	.419	Supported
H2b	*Attitude towards publishing/presenting has a positive, direct effect on behavioural intention*	.400	Supported
H2c	*Subjective Norms about academic productivity pressure (i.e., peer and superior) have a positive direct effect on behavioural intention*	---	Not supported
H2d	*Perceived Behavioural Control towards capabilities in publishing has positive direct effects on behavioural intention.*	.547	Supported

Table 4.22.2 Summary of mediating effects of TPB variables and KPB

	Statement of hypotheses H2b-d (mediating effects)	**Standardized effect**	**Results**
H2b	*Attitude towards publishing/presenting has a mediated effect on Knowledge Productivity Behaviour via behavioural intention.*	.207	Supported
H2c	*Subjective Norms about academic productivity pressure (i.e., peer and superior) have a mediated effect on Knowledge Productivity Behaviour via behavioural intention.*	---	Not supported
H2d	*Perceived Behavioural Control towards capabilities in publishing have a mediated effect on Knowledge Productivity Behaviour via behavioural intention.*	.282	Supported

Table 4.22.3 Summary of direct and indirect effects of Big Five and TPB variables

	Statement of hypotheses H3-H5	**Standardized effect**	**Results**
H3a	*Openness is positively related to Attitude towards publishing/presenting.*	.289	Supported
H3b	*Emotional stability is positively related to Attitude towards publishing/presenting.*	---	Not supported
H4a	*The relationship of Subjective Norms with intentions to engage in academic productivity behaviours is positively moderated by Extraversion.*	---	Not supported
H4b	*The relationship of Subjective Norms with intentions to engage in academic productivity behaviours is positively moderated by Agreeableness.*	---	Not supported
H5	*Conscientiousness is positively related to*	---	Not supported

	Perceived Behavioural Control towards capabilities in publishing.

APPENDIX 6.1 : TIME 1 SCIENCE TECHNOLOGY SAMPLE

Table 4.39.1 Summary of Hypothesis Testing regarding effects of KPB

	Statement of hypotheses H1a-e (B5)	Standardized effect	Results indicate for higher order KPB
H1a	*Openness has a positive relationship with Knowledge Productivity Behaviour.*	.497	Supported
H1b	*Emotional stability has a positive relationship with Knowledge Productivity Behaviour.*	---	Not supported
H1c	*Extraversion has a positive relationship with Knowledge Productivity Behaviour.*	---	Not supported
H1d	*Agreeableness may have either positive or negative relationships with Knowledge Productivity Behaviour.*	---	Not supported
H1e	*Conscientiousness has a positive relationship with Knowledge Productivity Behaviour.*	---	Not supported
	Statement of hypotheses H2a-d (TPB)	**Standardized effect**	**Results indicate for higher order KPB**
H2a	*Intention to engage in research activities has a direct, positive effect on Knowledge Productivity Behaviour.*	.559	Supported
H2b	*Attitude towards publishing/presenting has a positive, direct effect on behavioural intention*	.351	Supported
H2c	*Subjective Norms about academic productivity pressure (i.e., peer and superior) have a positive direct effect on behavioural intention.*	---	Not supported
H2d	*Perceived Behavioural Control towards capabilities in publishing has positive direct effects on behavioural intention.*	.525	Supported

Table 4.39.1.1 Summary of Hypothesis H1a-e B5 with KPB construct: KA, KS & KT

	Statement of hypotheses H1a-e B5 with KPB construct: KA	Standardized effect	Results indicate for higher order KPB
H1a	*Openness has a positive relationship with Knowledge Acquisition*	.489	Supported
H1b	*Emotional stability has a positive relationship with Knowledge Acquisition*	---	Not supported
H1c	*Extraversion has a positive relationship with Knowledge Productivity Behaviour*	---	Not supported
H1d	*Agreeableness may have either positive or negative relationships with Knowledge Productivity Behaviour.*	---	Not supported
H1e	*Conscientiousness has a positive relationship with Knowledge Acquisition*	---	Not supported
	Statement of hypotheses H1a-e B5 with KPB	**Standardized effect**	**Results indicate for higher order**

	construct: KS		KPB
H1a	*Openness has a positive relationship with Knowledge Sharing*	.420	Supported
H1b	*Emotional stability has a positive relationship with Knowledge Sharing*	---	Not supported
H1c	*Extraversion has a positive relationship with Knowledge Productivity Behaviour*	---	Not supported
H1d	*Agreeableness may have either positive or negative relationships with Knowledge Productivity Behaviour.*	---	Not supported
H1e	*Conscientiousness has a positive relationship with Knowledge Sharing*	---	Not supported
	Statement of hypotheses H1a-e B5 with KPB construct: KT	**Standardized effect**	**Results indicate for higher order KPB**
H1a	*Openness has a positive relationship with Knowledge Transfer*	.371	Supported
H1b	*Emotional stability has a positive relationship with Knowledge Transfer*	---	Not supported
H1c	*Extraversion has a positive relationship with Knowledge Productivity Behaviour*	---	Not supported
H1d	*Agreeableness may have either positive or negative relationships with Knowledge Productivity Behaviour.*	---	Not supported
H1e	*Conscientiousness has a positive relationship with Knowledge Transfer*	---	Not supported

Table 4.39.1.1.1 Summary of Hypothesis H2a-d TPB with KPB construct: KA, KS & KT

	Statement of hypotheses H2a-d TPB with KPB construct: KA	**Standardized effect**	**Results indicate for higher order KPB**
H2a	*Intention to engage in research activities has a direct, positive effect on Knowledge Acquisition, Knowledge Sharing and Knowledge Transfer.*	.460	Supported
H2b	*Attitude towards publishing/presenting has a positive, direct effect on behavioural intention*	.350	Supported
H2c	*Subjective Norms about academic productivity pressure (i.e., peer and superior) have a positive direct effect on behavioural intention*	---	Not supported
H2d	*Perceived Behavioural Control towards capabilities in publishing has positive direct effects on behavioural intention.*	.526	Supported
	Statement of hypotheses H2a-d TPB with KPB construct: KS	**Standardized effect**	**Results indicate for higher order KPB**
H2a	*Intention to engage in research activities has a direct, positive effect on Knowledge Sharing.*	.492	Supported
H2b	*Attitude towards publishing/presenting has a positive, direct effect on behavioural intention*	.350	Supported
H2c	*Subjective Norms about academic productivity*	---	Not supported

	pressure (i.e., peer and superior) have a positive direct effect on behavioural intention		
H2d	*Perceived Behavioural Control towards capabilities in publishing has positive direct effects on behavioural intention.*	.526	Supported
	Statement of hypotheses H2a-d TPB with KPB construct: KT	**Standardized effect**	**Results indicate for higher order KPB**
H2a	*Intention to engage in research activities has a direct, positive effect on Knowledge Transfer.*	.465	Supported
H2b	*Attitude towards publishing/presenting has a positive, direct effect on behavioural intention*	.350	Supported
H2c	*Subjective Norms about academic productivity pressure (i.e., peer and superior) have a positive direct effect on behavioural intention*	---	Not supported
H2d	*Perceived Behavioural Control towards capabilities in publishing has positive direct effects on behavioural intention.*	.526	Supported

Table 4.39.2 Summary of mediating effects of TPB variables and KPB

	Statement of hypotheses H2b-d (mediating effects)	**Standardized effect**	**Results**
H2b	*Attitude towards publishing/presenting has a mediated effect on Knowledge Productivity Behaviour via behavioural intention.*	.196	Supported
H2c	*Subjective Norms about academic productivity pressure (i.e., peer and superior) have a mediated effect on Knowledge Productivity Behaviour via behavioural intention.*	---	Not supported
H2d	*Perceived Behavioural Control towards capabilities in publishing have a mediated effect on Knowledge Productivity Behaviour via behavioural intention.*	.293	Supported

Table 4.39.3 Summary of direct and indirect effects of Big Five and TPB variables

	Statement of hypotheses H3-H5	**Standardized effect**	**Results**
H3a	*Openness is positively related to Attitude towards publishing/presenting.*	.341	Supported
H3b	*Emotional stability is positively related to Attitude towards publishing/presenting.*	---	Not supported
H4a	*The relationship of Subjective Norms with intentions to engage in academic productivity behaviours is positively moderated by Extraversion.*	---	Not supported
H4b	*The relationship of Subjective Norms with intentions to engage in academic productivity behaviours is positively moderated by Agreeableness.*	---	Not supported
H5	*Conscientiousness is positively related to*	---	Not supported

	Perceived Behavioural Control towards capabilities in publishing.

APPENDIX 7 : TIME 2 SOCIAL SCIENCE SAMPLE

Table 5.18.1 Summary of Hypothesis Testing regarding effects of KPB

	Statement of hypotheses H1a-e (B5)	Standardized effect	Results indicate for higher order KPB
H1a	*Openness has a positive relationship with Knowledge Productivity Behaviour.*	.358	Supported
H1b	*Emotional stability has a positive relationship with Knowledge Productivity Behaviour.*	---	Not supported
H1c	*Extraversion has a positive relationship with Knowledge Productivity Behaviour.*	---	Not supported
H1d	*Agreeableness may have either positive or negative relationships with Knowledge Productivity Behaviour.*	---	Not supported
H1e	*Conscientiousness has a positive relationship with Knowledge Productivity Behaviour.*	---	Not supported
	Statement of hypotheses H2a-d (TPB)	**Standardized effect**	**Results indicate for higher order KPB**
H2a	*Intention to engage in research activities has a direct, positive effect on Knowledge Productivity Behaviour.*	.554	Supported
H2b	*Attitude towards publishing/presenting has a positive, direct effect on behavioural intention*	.491	Supported
H2c	*Subjective Norms about academic productivity pressure (i.e., peer and superior) have a positive direct effect on behavioural intention.*	---	Not supported
H2d	*Perceived Behavioural Control towards capabilities in publishing has positive direct effects on behavioural intention.*	.410	Supported

Table 5.18.1.1 Summary of Hypothesis H1a-e B5 with KPB construct: KA, KS & KT

	Statement of hypotheses H1a-e B5 with KPB construct: KA	Standardized effect	Results indicate for higher order KPB
H1a	*Openness has a positive relationship with Knowledge Acquisition*	.239	Supported
H1b	*Emotional stability has a positive relationship with Knowledge Acquisition*	---	Not supported
H1c	*Extraversion has a positive relationship with Knowledge Productivity Behaviour*	---	Not supported
H1d	*Agreeableness may have either positive or negative relationships with Knowledge Productivity Behaviour.*	---	Not supported
H1e	*Conscientiousness has a positive relationship with Knowledge Acquisition*	---	Not supported
	Statement of hypotheses H1a-e B5 with KPB	**Standardized effect**	**Results indicate for higher order**

	construct: KS		KPB
H1a	*Openness has a positive relationship with Knowledge Sharing*	.244	Supported
H1b	*Emotional stability has a positive relationship with Knowledge Sharing*	---	Not supported
H1c	*Extraversion has a positive relationship with Knowledge Productivity Behaviour*	---	Not supported
H1d	*Agreeableness may have either positive or negative relationships with Knowledge Productivity Behaviour.*	---	Not supported
H1e	*Conscientiousness has a positive relationship with Knowledge Sharing*	.148	Supported
	Statement of hypotheses H1a-e B5 with KPB construct: KT	**Standardized effect**	**Results indicate for higher order KPB**
H1a	*Openness has a positive relationship with Knowledge Transfer*	.228	Supported
H1b	*Emotional stability has a positive relationship with Knowledge Transfer*	---	Not supported
H1c	*Extraversion has a positive relationship with Knowledge Productivity Behaviour*	---	Not supported
H1d	*Agreeableness may have either positive or negative relationships with Knowledge Productivity Behaviour.*	---	Not supported
H1e	*Conscientiousness has a positive relationship with Knowledge Transfer*	---	Not supported

Table 5.18.1.1.1 Summary of Hypothesis H2a-d TPB with KPB construct: KA, KS & KT

	Statement of hypotheses H2a-d TPB with KPB construct: KA	**Standardized effect**	**Results indicate for higher order KPB**
H2a	*Intention to engage in research activities has a direct, positive effect on Knowledge Acquisition, Knowledge Sharing and Knowledge Transfer.*	.402	Supported
H2b	*Attitude towards publishing/presenting has a positive, direct effect on behavioural intention*	.491	Supported
H2c	*Subjective Norms about academic productivity pressure (i.e., peer and superior) have a positive direct effect on behavioural intention*	---	Not supported
H2d	*Perceived Behavioural Control towards capabilities in publishing has positive direct effects on behavioural intention.*	.410	Supported
	Statement of hypotheses H2a-d TPB with KPB construct: KS	**Standardized effect**	**Results indicate for higher order KPB**
H2a	*Intention to engage in research activities has a direct, positive effect on Knowledge Sharing.*	.313	Supported
H2b	*Attitude towards publishing/presenting has a positive, direct effect on behavioural intention*	.491	Supported
H2c	*Subjective Norms about academic productivity*	---	Not supported

	pressure (i.e., peer and superior) have a positive direct effect on behavioural intention		
H2d	*Perceived Behavioural Control towards capabilities in publishing has positive direct effects on behavioural intention.*	.410	Supported
	Statement of hypotheses H2a-d TPB with KPB construct: KT	**Standardized effect**	**Results indicate for higher order KPB**
H2a	*Intention to engage in research activities has a direct, positive effect on Knowledge Transfer.*	.406	Supported
H2b	*Attitude towards publishing/presenting has a positive, direct effect on behavioural intention*	.491	Supported
H2c	*Subjective Norms about academic productivity pressure (i.e., peer and superior) have a positive direct effect on behavioural intention*	---	Not supported
H2d	*Perceived Behavioural Control towards capabilities in publishing has positive direct effects on behavioural intention.*	.410	Supported

Table 5.18.2 Summary of mediating effects of TPB variables and KPB

	Statement of hypotheses H2b-d (mediating effects)	**Standardized effect**	**Results**
H2b	*Attitude towards publishing/presenting has a mediated effect on Knowledge Productivity Behaviour via behavioural intention.*	.272	Supported
H2c	*Subjective Norms about academic productivity pressure (i.e., peer and superior) have a mediated effect on Knowledge Productivity Behaviour via behavioural intention.*	---	Not supported
H2d	*Perceived Behavioural Control towards capabilities in publishing have a mediated effect on Knowledge Productivity Behaviour via behavioural intention.*	.227	Supported

Table 5.18.3 Summary of direct and indirect effects of Big Five and TPB variables

	Statement of hypotheses H3-H5	**Standardized effect**	**Results**
H3a	*Openness is positively related to Attitude towards publishing/presenting.*	.281	Supported
H3b	*Emotional stability is positively related to Attitude towards publishing/presenting.*	---	Not supported
H4a	*The relationship of Subjective Norms with intentions to engage in academic productivity behaviours is positively moderated by Extraversion.*	---	Not supported
H4b	*The relationship of Subjective Norms with intentions to engage in academic productivity behaviours is positively moderated by Agreeableness.*	---	Not supported
H5	*Conscientiousness is positively related to*	---	Not supported

	Perceived Behavioural Control towards capabilities in publishing.